

Localization Barriers to Trade: Threat to the Global Innovation Economy

BY STEPHEN J. EZELL, ROBERT D. ATKINSON, AND MICHELLE A. WEIN | SEPTEMBER 2013

Localization barriers to trade represent one of the most rapidly growing forms of trade protectionism and perhaps constitute today's greatest threat to the further liberalization of the global trading system.

Countries' use of localization barriers to trade (LBTs)—policies that seek to explicitly pressure foreign enterprises to localize economic activity in order to compete in a country's markets—has grown dramatically. But LBTs, such as forced local production or forced technology or intellectual property (IP) transfer as a condition of market access harm the global innovation economy, the countries affected by them, and even the very countries that implement them—all while distracting countries from focusing on implementing productivity- and innovation-based policies that could deliver stronger, more sustained economic growth. This report documents the growing global use of LBTs and explains what to do about it.

INTRODUCTION

As ITIF writes in *Innovation Economics: The Race for Global Advantage*, as an increasing number of countries have come to realize that innovation fundamentally drives economic growth, a fierce race for global innovation advantage has emerged. As a result, countries have begun implementing a range of aggressive policies designed to increase the productivity and innovation capacity of existing enterprises while also seeking to incubate, grow, or attract companies operating in high-value-added industries such as manufacturing, information and communications technology (ICT), renewable energy, and life sciences.¹

But notwithstanding the fact that the best way for nations to cultivate high-growth, innovation-based economies is to get key economic framework conditions right; to create an institutional environment that supports innovation, entrepreneurship, and technical

change; and to achieve across-the-board productivity growth, a growing number of countries are resorting to “innovation mercantilism”—using distortive, protectionist trade policies to achieve the innovation-based economic growth they seek.

Increasingly, these countries’ economic development strategies consist of two central aims: 1) capturing foreign direct investment (FDI), particularly in the form of establishments of multinational enterprises performing globally mobile research and development (R&D), production, or manufacturing operations; and 2) favoring domestic establishments owned by domestic enterprises as they compete in the domestic (and global) economy by systematically disadvantaging foreign competitors. In this regard, it’s important to recognize that many companies, and all large ones, are multi-establishment enterprises—an establishment being the factory, R&D center, headquarters office, or other facility of a business enterprise. (For example, General Motor is an enterprise, but it has hundreds of establishments, such as car assembly factories and research centers, operating throughout the world.) Many countries’ economic development strategies increasingly have been capturing a larger share of this type of multinational enterprise establishment activity as a central objective.

Unfortunately, rather than trying to attract foreign investment and economic activity based on an economy’s underlying comparative advantages—e.g., rule of law, pools of highly skilled talent, strong digital and physical infrastructures, competitive tax systems, and even generous industrial recruitment incentives—a growing number of countries are attempting to compel foreign establishment operation in their nations through “localization barriers to trade” that seek to force the localization of global economic activity to their shores. To coin a phrase from the movie *The Godfather*, they are making multinational companies “an offer they cannot refuse.”

Thus, unfortunately, while the international trade community has made great strides in removing tariff-based barriers to global trade over the past three decades (the median global tariff rate has declined from 26 percent in 1980 to less than 7 percent today), in many cases countries have surreptitiously complemented their reduction by erecting new types of trade-distorting non-tariff measures (NTMs), such as the LBTs.² And according to the World Trade Organization’s (WTO’s) *2012 World Trade Report*, such non-tariff measures are almost twice as trade-restrictive as tariffs.³ And their use is rapidly growing. Even the WTO has warned that trade protectionism is approaching dangerously high levels throughout the world, noting that the number of technical barriers to trade reported in 2012 reached a record high of 1,560.⁴ And much of this growth has come from the increased use of localization barriers to trade, which are one of the most rapidly growing forms of trade protectionism and perhaps today’s greatest threat to the further liberalization of the global trading system.

But, as this report demonstrates, though localization barriers to trade appear as if they would benefit the countries that field them by promising a quick mechanism to bring economic activity to their shores, in reality LBTs are not an unalloyed good for the countries that implement them, and are downright harmful to the broader global economy.

Moreover, when countries resort to competing through the use of LBTs, they often neglect the superior opportunity to enact a range of pro-innovation economic development policies that fundamentally raise the competitiveness of their economy by enabling it to attract foreign direct investment and establishment production on its own merits. These policies include: getting right key framework conditions, such as establishing the rule of law, making it easy for entrepreneurs to start new businesses, and protecting intellectual property; investing in education, infrastructure, scientific research, and technology; and implementing effective tax and regulatory systems. Fairly competing based on the strength of a country's ability to implement these "good" innovation policies—not resorting to trade-distorting innovation mercantilist practices—is the optimal way for countries to realize the innovation-based growth they seek in the 21st century economy.⁵

This report begins by providing a framework for understanding global economic development policies. It then provides a typology and extensive documentation of countries' use of localization barriers to trade; explains why LBTs are injurious to the countries and enterprises affected by them, to the global economy, and even often to the countries that implement them; articulates an alternative productivity- and innovation-based economic development path that countries can follow to achieve the innovation-based economic growth they seek; and recommends policies that countries and global multilateral organizations can undertake to push back against the spread of LBTs.

Summary Policy Recommendations:

- The World Trade Organization should take a stronger role in enforcing existing laws regarding local content requirements.
- The WTO should extend its dispute settlement mechanism to cover other LBTs beyond local content requirements.
- The WTO should establish a comprehensive database to track LBTs worldwide.
- The U.S. Congress should establish a 40 percent tax credit for all expenditures made by companies related to bringing such cases before the WTO. In addition, Congress should pass legislation allowing firms to obtain Department of Justice approval for anti-trust exemptions to coordinate actions regarding technology transfer and investment toward other nations that have installed LBTs.
- The United States and the European Union should remove nations from Generalized Systems of Preferences if the country has erected more than incidental localization barriers to trade (or other mercantilist practices).
- National and international economic, trade, and development organizations, including the World Bank, International Monetary Fund, Overseas Private Investment Corporation (OPIC), Agency for International Development (AID), Millennium Challenge Corporation (MCC), Export-Import Bank, European Bank for Reconstruction and Development, and others, should both stop promoting export-led growth as a solution to development, and tie any assistance to steps

taken by developing nations to move away from LBTs—thereby rewarding countries whose policies are focused on spurring across-the-board productivity through non-mercantilist means.

- Nations committed to market-based trade should bring more cases addressing LBTs before the WTO.
- All new bilateral and regional trade agreements should be constructed so as to fully eschew LBTs and other mercantilist practices (such as indigenous innovation).

A FRAMEWORK FOR UNDERSTANDING GLOBAL ECONOMIC DEVELOPMENT POLICIES

The global economic downturn wrought by the Great Recession has intensified pressure on governments worldwide to boost their countries' sagging economic growth rates. Unfortunately, in too many cases, this has led policymakers to turn to a range of trade-distorting mercantilist measures intended to generate growth in the short-term by reducing imports and/or increasing exports. All too often these have crowded out productivity- and innovation-enhancing economic policies designed to enhance long-term growth.

In order to better understand the range of economic development policies nations have put in place, it is important to develop a typology. In this framework, policies can be differentiated along two axes. The first addresses whether policies target domestic or foreign firms. Some policies seek to grow an economy by discriminating in favor of domestically owned firms, believing—usually incorrectly as it turns out—that local firms contribute more to the domestic economy than foreign-owned firms. Other policies target foreign firms, sometimes with incentives, but more often with coercion, to produce locally, believing—again, usually incorrectly—that such policies maximize growth. The second axis addresses whether policies focus on spurring across-the-board innovation and productivity growth or whether policies are more mercantilist-inspired, seeking to reduce imports or spur exports. As Figure 1 shows, there are essentially four types of economic development policies that countries are presently implementing. Three have as their central aim the mercantilist goal of accelerating growth by reducing imports and/or increasing exports. The four categories are:

1. **“Localization barriers to trade”**: These policies pressure foreign enterprises to shift production and/or intellectual property to the nation putting in place the policies.
2. **“Indigenous innovation”**: These policies provide preferential treatment of domestic enterprises at the expense of foreign ones.
3. **“General mercantilism”**: These policies seek to boost production by increasing exports and/or reducing imports largely by making imports more expensive and exports cheaper, but they are indifferent to whether they affect domestic and foreign enterprises. What matters is where the production is, not who performs it.

In too many cases, policymakers around the world have turned to a range of trade-distorting mercantilist measures intended to generate growth in the short-term by reducing imports and/or increasing exports.

4. **“Enterprise support”**: These policies seek growth through higher productivity and increased innovation—regardless of whether the sector is “traded” or not—and aim more to assist, rather than coerce enterprises. While virtually all countries have policies in this category, for an increasing number of countries, the relative “share” of these policies compared to the other three kinds has been shrinking.

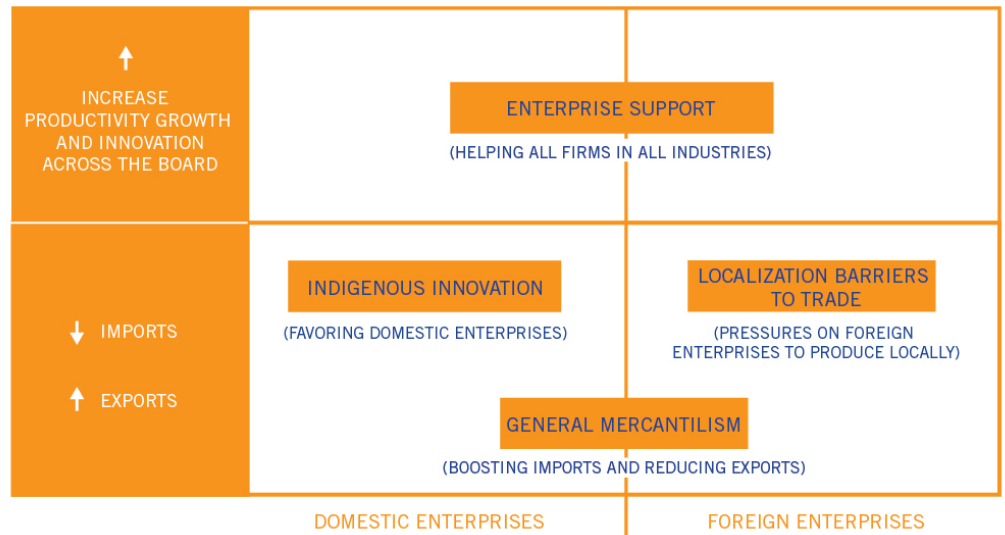


Figure 1: A Matrix for Understanding Global Economic Development Policies

Localization barriers to trade: LBTs seek to explicitly pressure foreign enterprises to localize economic activity in order to sell in a country’s marketplace. Effectively, LBTs seek to force foreign enterprises to produce locally what the enterprise would otherwise produce outside the nation’s borders and export to another economy. Their goal is to capture the investment or production of the establishments of foreign enterprises by imposing mandated, location-based restrictions—often as a condition of market access—on the production of goods and services, the storage and processing of data, and even the transfer of technology and intellectual property. As Figure 2 illustrates, LBTs include the following four overarching types of policies: local content requirements; local production as a condition of market access; forced offsets; and forced technology or intellectual property transfer (often as a condition of market access).



Figure 2: A Framework for Understanding Global Economic Development Policies

For instance, local content requirements—perhaps the most common and fastest growing form of localization barrier to trade—require that a foreign enterprise seeking to sell a product (such as automobiles, wind turbines, telecommunications equipment, etc.) into a country’s market must include a certain percentage of domestically produced components in order to do so. For example, India has imposed significant local content requirements on foreign enterprises that wish to sell solar panels and ICT equipment in the country. Equally, the requirements of countries such as Russia, South Korea, or Venezuela that foreign enterprises must locate data centers or other ICT infrastructure locally as a condition of providing digital services to businesses and consumers in the country constitute localization barriers to trade. So too do requirements that foreign enterprises transfer their technology or intellectual property as a condition of competing in a country’s marketplace, as China has mandated in its high-speed rail market. In another example, the Chinese government has made tax breaks available to Chinese citizens purchasing electric

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vehicles made by domestic vehicle manufacturers but not those made by foreign vehicle manufacturers—unless the foreign enterprise transfers intellectual property to China. But while localization barriers to trade come in many forms—as the following section of this report illuminates—the distinguishing feature about LBTs is that they target foreign enterprises and attempt to compel the enterprise to produce within-country what the enterprise otherwise would produce elsewhere and export to the recipient country.

Indigenous innovation: A second set of policies countries have implemented in their quest to boost economic growth entails favoring domestically owned enterprises—usually at the expense of foreign enterprises—in order to enhance their competitive position both as they compete in the domestic marketplace, and as their exports compete on global markets. As Figure 2 depicts, such policies include providing financial benefits only to domestically owned enterprises, including for instance low interest loans, land grants, cash subsidies, tax incentives or tax forgiveness, or financial preferences for state-owned enterprises. They also include regulations favoring domestic enterprises by making it more difficult for foreign enterprises to compete locally, such as by introducing domestic technology standards, onerous regulatory certification requirements, or unjustified conformity assessment procedures. And they include regulations that actually seek to block out competition from foreign enterprises that would like to sell products or services to the destination country, such as when countries introduce government-sanctioned monopolies and controls on foreign purchases, or when they limit foreign sales or foreign direct investment. While again these policies come in a variety of forms, their essence is that they seek to discriminate in favor of domestically owned enterprises.

Examples of such indigenous innovation policies that countries have introduced to provide preferential treatment for domestic enterprises abound. For instance, China’s eponymous “indigenous innovation” policy framework is designed to help Chinese-owned companies compete against foreign-owned firms. China implements this through discriminatory government procurement, massive subsidies to Chinese-owned firms, and even outright discrimination against foreign firms. For example, China’s central government has set a quota that only 34 foreign revenue-sharing films can be shown in China per year.⁶ Vietnam restricts foreign investment in cinema construction and operation. India limits and in some cases outright bans foreign retailers from selling directly to Indian consumers using e-commerce. Argentina has imposed on mining companies a requirement that they must use Argentine transport companies for the exportation of minerals. And a range of countries—from China and India to Brazil, South Africa, and South Korea—have introduced testing and registration requirements for a broad range of ICT products that are so onerous that they can effectively exclude foreign enterprises from markets altogether. For example, certification requirements that India imposed on foreign ICT products in April 2013 were developed with limited industry consultations, deviated in significant and impactful ways from international norms, could not be implemented as published due to the lack of testing capacity and infrastructure, and made it nearly impossible for companies to import a wide range of ICT products.⁷

General mercantilism: This category includes policies that have the effect of broadly increasing the price of imports while reducing the cost of exports. Currency manipulation, in particular, is a commonly used, blanket, economy-wide, trade-distorting policy that affects all traded industries equally. Indeed, trade analysts at the Peterson Institute for International Economics have found that a number of economies—including Argentina, Brazil, China, Hong Kong, India, Indonesia, Israel, Japan, Malaysia, the Philippines, Singapore, South Africa, South Korea, Switzerland, Taiwan, Thailand, and Turkey—have all recently intervened in currency markets to prevent their currency from appreciating, thus making their exports less, and imports more, expensive.⁸ Countries' tariffs (and other trade barriers, such as customs restrictions) have a similar effect by raising the price of imports. Conversely, export subsidies—such as the direct subsidies Japan and South Korea have awarded to high-tech manufacturing firms to reach targets for export sales, or the more than \$15 billion China has spent on its steel industry alone since 2007—are designed to lower costs for a country's exporters.⁹ But again, the key feature of this third set of policies is that—while they certainly are all trade-distorting—they treat domestic and foreign firms the same, so long as those firms are producing locally.

Enterprise support: Finally, the fourth, and superior, set of policies that countries can implement to achieve faster and more sustainable economic growth—although they are all-too-often neglected or eschewed for policies in one of the prior three categories—entails enacting a range of pro-innovation economic development policies that not only fundamentally raise the competitiveness of a nation's economy and its ability to attract foreign direct investment on its own merits, but also, and more importantly, seek to boost productivity growth across-the-board in all industries—traded and non-traded alike. These policies include: implementing effective pro-growth tax and regulatory systems; getting right key framework conditions, such as establishing the rule of law, making it easy for entrepreneurs to start new businesses, and protecting intellectual property; and investing in key building blocks of growth, such as education and skills, digital and physical infrastructure, and scientific and technical research. It also includes policies specifically designed to bolster innovation and support development of new technologies (or adoption of existing ones). These include creating national innovation policies; implementing agricultural and manufacturing extension services; spurring the transfer and commercialization of technologies from university to industry; and putting in place e-government and e-commerce policies.

For instance, some three-dozen countries, including Ghana, India, Singapore, Thailand, and Uruguay, have all recently put in place sophisticated national innovation strategies. Brazil and Peru have strengthened patent rights (leading to a dramatic increase of patent applications in the former country's biotechnology sector). Portugal has introduced a new system of online business registration that allows businesses to register online in just 45 minutes (a process that takes 120 days in Brazil, by contrast). Chile and Peru have launched programs to attract and support domestic and foreign entrepreneurs. Australia, Brazil, Chile, France, India, Portugal, and Spain have introduced more generous R&D tax credits.¹⁰ Chile, Hungary, and Spain, among others, have introduced collaborative R&D tax credits. Sweden and Finland have restructured their university systems to make them

more efficient engines of technology transfer.¹¹ Germany has invested in a nationwide system of technical research institutes that work closely with industry.¹² Numerous countries, including Brazil, China, India, Indonesia, Japan, Malaysia, the Philippines, Russia, Singapore, South Africa, South Korea, and Taiwan have established policies that grant their universities IP ownership rights for IP generated by federal funding of R&D. And a wide range of developed and developing countries alike have put in place ICT infrastructure promotion policies that seek to spur deployment and adoption of digital technologies.

As the final section of this report will further articulate, fairly competing based on the strength of a country's ability to implement these types of pro-innovation policies—not resorting to trade-distorting mercantilist practices—is the optimal way for countries to realize the innovation-based growth they seek in the 21st century economy.¹³ Implementing these types of policies is where countries should be focusing their attention. Still, all too many countries are looking to take a shortcut to unsustainable growth, as evidenced particularly by the growing global use of trade-distorting policies such as localization barriers to trade—the subject to which this report now turns.

LOCALIZATION BARRIERS TO TRADE

Localization barriers to trade seek to force foreign companies to produce locally what they otherwise would produce outside a nation's borders and export to a recipient economy. Localization barriers to trade include:

- Local content requirements in private and/or public procurement;
- Requirement of local production as a condition to access public or private markets;
- Forced offsets; and
- Forced technology or intellectual property transfer as a condition of market access, including forced joint ventures as a condition of market access.

Types of Localization Barriers to Trade

This section begins with a brief overview of the different types of localization barriers to trade and then proceeds to comprehensively assess countries' localization barriers to trade by industry sector.

Local Content Requirements in Private and/or Public Procurement

Countries use local content requirements (LCRs) more than any other type of LBT. In fact, analysts from the Peterson Institute for International Economics estimate that local content requirements affected almost \$928 billion of total global trade in goods and services in 2010, or about 5 percent of the \$18.5 trillion of total global trade.¹⁴ They estimate that the actual reduction of world trade on account of new LCRs amounts to \$93 billion annually and that almost 3.8 million jobs are affected by LCRs.¹⁵

Dozens of countries—including Argentina, Brazil, Canada, China, India, Indonesia, Malaysia, Mexico, Nigeria, Russia, Turkey, and Vietnam, among many others—have introduced local content requirements, which mandate that a certain percentage of goods

or services sold in a country must be produced with local content. Countries define “local content” in a variety of ways, such as the percentage of local components used in the assembly of a final product; the share of locally developed intellectual property embodied in the development of a product or service; or even the share of locally produced or local content in the broadcasting and audio/visual sectors. Countries’ local content requirements impact both private and public sector procurement activities. Countries have implemented LCRs in virtually all sectors of economic activity, ranging from information and communications technology, energy, and pharmaceuticals, to financial services and media. In fact, some countries, such as Brazil, “have made local content requirements a centerpiece of their industrial policy,” with LCRs touching sectors ranging from ICT, energy, equipment and machinery, health, media, reinsurance, textiles, and even apparel and footwear.¹⁶ In fact, Brazil has introduced more new local content requirements than any other nation since 2008.¹⁷

What’s changed in recent years is not only the dramatic increase in countries’ use of local content requirements, but also the increase in sophistication of countries’ methods in applying LCRs.

To be sure, local content requirements have existed for decades, and have been the subject of numerous WTO dispute settlement cases, which have overwhelmingly found LCRs to violate Article III of the GATT (the General Agreement on Tariffs and Trade, whose provisions are incorporated into WTO rules), which prohibits member nations from discriminating against foreign competitors by forcing them into “buy local” contracts with domestic suppliers for purposes of private sector procurements.

However, what’s changed in recent years is not only the dramatic increase in countries’ use of local content requirements, but also the increase in sophistication of countries’ methods in applying LCRs, such as by basing the local content calculation in part on the percentage of domestically produced intellectual property embodied in the product or in linking local content requirements in public procurement to security exemptions articulated in the GATT.

For example, in February 2012, the Indian Ministry of Communications and Information Technology (MCIT) announced a Preferential Market Access mandate for electronic goods (the PMA Mandate) which imposed local content requirements on the procurement of telecommunications and information technology products by both government and private sector entities with “security implications for the country.” As originally envisioned, a specified share of each telecommunications product’s market—starting at 30 percent in 2012 and rising to 100 percent by 2020—would have to be filled by India-based manufacturers.¹⁸ For information technology products, the local content percentage started at 25 percent, rising to 45 percent within five years.¹⁹

Indian officials have argued as a principal justification for the PMA that the country needs more made-in-India products in part to protect against growing cybersecurity risks. To be sure, India, like all countries, faces significant and legitimate cybersecurity concerns. But India’s attempt to justify the PMA on security grounds ignores global norms, which hold that the best approaches to security are based on risk management and public-private partnerships and acknowledge that the security of ICT products or components is dependent upon how they are developed, produced, and deployed—not on where they are

manufactured.²⁰ Rather, there was another troubling element at play in India's proclamation of the PMA, and that was a desire to bolster domestic manufacturing of ICT hardware.

While the Indian government announced on July 8, 2013 a suspension and review of the Preferential Market Access mandate—which may result in India rescinding application of the PMA for private sector procurement—India will likely maintain PMA requirements in terms of public procurement.²¹ Regardless, India's threat of invoking national security as the grounds for interference in private sector procurements of ICT equipment has created a dangerous precedent that other countries, such as Brazil, have since started to mirror.

In summary, just as many countries are trying to move their economies “up the value chain” toward higher value-added activities such as advanced manufacturing, conducting research and development, or developing intellectual property, so are those same countries trying to move their local content requirements “up the value chain” to where they affect not just local content as applied to manufacturing, but also local content as applied to R&D and intellectual property. Combined with the rapidly growing use of local content requirements, these trends have made LCRs one of the most pernicious forms of LBTs in the modern global economy, as the latter part of this section demonstrates in documenting countries' extensive use of LCRs across a range of economic sectors.

Local data storage or data residency requirements—which mandate that data must be stored and/or processed within a country—represent a fundamental localization barrier to digital trade.

Local Production as a Condition of Market Access

While local content requirements stipulate that a certain percentage of a product or service sold into an economy must embody or incorporate a share of locally produced components or intellectual property, another form of LBT mandates local production of a product or service as a condition of market access. For instance, requirements that enterprises must use local ICT infrastructure—such as local data centers—to provide digital services such as Web search to an economy effectively manifest a requirement of local production as a condition of market access. For example, the local data center laws Indonesia is currently developing will require foreign digital service providers to use local data centers when providing digital services to the Indonesian economy.

Likewise, local data storage or data residency requirements—which mandate that data must be stored and/or processed within a country—represent a fundamental localization barrier to digital trade. By definition, they simultaneously impede cross-border data flows and act as a constraint on the provision of digital services, such as cloud computing.²²

In other cases, countries outright declare that foreign enterprises must produce in full locally in order to sell locally. For instance, Brazil requires that 100 percent of all films and television shows be printed locally. This means that, instead of producing the actual film reel elsewhere and shipping it to a Brazilian cinema, the actual tape for the film reel must be printed locally inside Brazil. Brazil likewise prohibits importation of color prints (e.g., the posters displayed in cinemas to promote movies).²³ Such requirements of local production as a condition of market access fundamentally contravene the foundational principles of liberalized trade.

Forced Offsets

Forced offsets encompass a range of industrial compensation arrangements required by foreign governments as a condition of public procurement (and sometimes private procurement) contracts.²⁴ Though historically offsets have been used primarily in the aerospace and defense industries—usually associated with countries’ purchases of defense products manufactured abroad—some governments have recently expanded the use of forced offsets beyond these two areas to broader public procurement activity. For instance, India recently expanded its use of offsets to include civil aviation, and “has indicated that it is considering broadening the areas of acceptable offsets.”²⁵ Turkey also seeks to introduce offsets in civil aviation. Forced offsets also include the export equalization measures that countries such as Argentina have begun to implement, which require that a foreign enterprise match every \$1 of products it imports into a country with \$1 of exports.

Though their usage is broadening, offsets still remain most common in the defense arena. The U.S. Bureau of Industry Security (BIS) requires firms to report the offsets they encounter, classify them by type (direct or indirect), and specifically describe the nature of each transaction. Direct offsets in defense are characterized as those offsets whose transaction directly relates to the article(s) or service(s) exported or to be exported, pursuant to a military export sales agreement. Indirect offsets are those offsets whose transaction is unrelated to the article(s) or service(s) exported or to be exported, pursuant to a military export sales agreement. In the offset reporting regulations, BIS categorizes offset transactions as one of the following: co-production, technology transfer, subcontracting, credit assistance, training, licensed production, investment, purchases, and other, as Figure 3 illustrates.

To provide a sense of how forced offsets impact the U.S. defense industry, in 2011, nine U.S. firms reported entering into 59 contracts that had related offset agreements for the sale of defense items and services. These contracts, signed with 27 countries, were valued at \$10.7 billion. The offset agreements were valued at \$5.48 billion, which equaled 50.9 percent of the value of the signed defense export sales contracts. During 2011, reported offset agreements ranged from a low of 25 percent of the defense export sales contract value to a high of 100 percent.²⁶

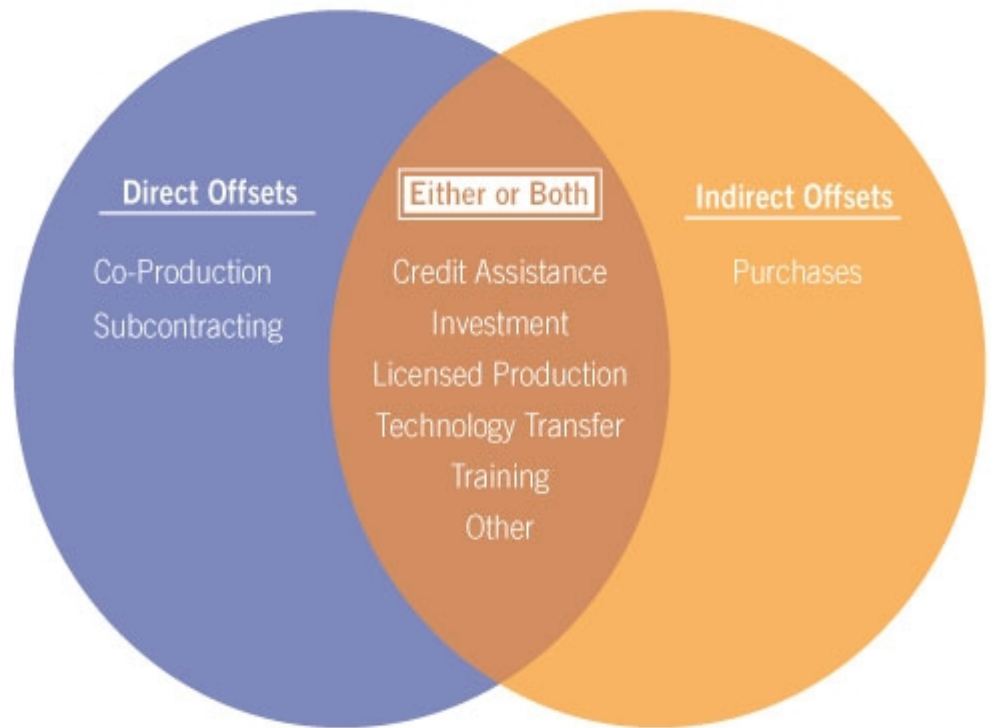


Figure 3: Types of Offsets²⁷

Requirement of Intellectual Property or Technology Transfer as a Condition of Market Access

Requirements that firms transfer intellectual property or technology as a condition of market access—often as part of required joint ventures—have become an increasingly common forced localization tactic. These requirements constitute localization barriers to trade because they force companies to give up technology or intellectual property as a condition of operating or selling products and services in a country.

But nations that condition market access on technology or intellectual property transfer are unfairly obtaining knowledge for competitive advantage.²⁸ As David Joy, Chief Market Strategist for Ameriprise Financial, states, “To me, that’s [forced technology transfer] actually the biggest issue, more even than currency valuation. Being forced to give up technology for access to the market is essentially blackmail.”²⁹

Many nations seek to engage in forced intellectual property or technology transfer as a condition of market access, but no nation does it more than China. Indeed, forced technology transfer is a cornerstone of China’s economic strategy. As BASF Chairman and Chief Executive Jürgen Hambrecht states bluntly, foreign companies doing business in China face the “forced disclosure of know-how.”³⁰ This is why in a survey of U.S.

Forced technology or intellectual property transfer requirements impose a localization stipulation by making the transfer of these intangible assets a condition of an enterprise producing or competing in local markets.

executives doing business in China by the U.S. Bureau of Industry and Security, “the majority of industry representatives interviewed clearly stated that technology transfers are required to do business in China.”³¹

In fact, it’s commonplace in China to require that firms transfer technology in exchange for being granted the ability to invest in the country. In the *Catalogue for the Guidance of Foreign Investment Industries (2007)*, joint ventures with foreign firms have to be approved, and technology transfer agreements reached within joint venture contracts must also be submitted for approval. The guidelines encourage transfer of technology.³² In fact, as one publication stated, the Chinese central government requires foreign firms:

To form joint ventures with its national champions and transfer the latest technology in exchange for current and future business opportunities. Companies that resist are simply excluded from projects. The Chinese government uses the restrictions to drive wedges between foreign rivals vying to land big projects in the country and induce them to transfer the technologies that state-owned enterprises need to catch up. Executives working for multinational companies in China privately acknowledge that making official complaints or filing lawsuits usually does little good.³³

While Chinese representatives insist that they have removed such formal intellectual property and technology transfer requirements—and indeed they may no longer be officially stipulated by stated policy—these types of requirements are still in effect informally. As the United States Trade Representative Office’s *2013 Special 301* report notes:

Chinese regulations, rules, and other measures frequently call for technology transfer and, in certain cases, require, or propose to require, that eligibility for government benefits or preferences be contingent upon IPR [intellectual property rights] being developed in China, or being owned by or licensed, in some cases exclusively, to a Chinese party. In some cases, central, provincial and local level Chinese agencies inappropriately require or pressure rights holders to transfer IPR from foreign to domestic entities. Sometimes guided by government measures or policy statements intended to promote indigenous innovation and the development of strategic industries, government authorities deny or delay market access or otherwise condition government procurement, permissions, subsidies, tax treatment and other actions on IPR being owned or developed in China, or licensed to a Chinese entity.³⁴

And while China does not always make forced technology or IP transfer requirements explicit, frequently foreign firms are not permitted to wholly own their investments, and are required to enter into joint venture (JV) agreements with Chinese firms, often state-owned, in which the Chinese firm has control. These coerced agreements are designed to allow Chinese firms to learn from the foreign firms so that they can later compete independently against them (and in part to keep profits from the venture in China).

Indeed, China's policies often require foreign companies to form joint ventures with Chinese companies, giving the Chinese partner at least a 50 percent ownership stake, as a prerequisite of entering the Chinese market.³⁵ Because China's market is so large and fast growing, the allure of immediate market access for foreign firms often trumps the longer-term potential damage from having to give away some of their technology secrets as the quid pro quo.

But while China is one of the worst perpetrators, it is far from alone in using forced technology or intellectual property transfer as a condition of market access. As the following half of this section explains in examining LBTs by sector, many other countries, including India, Indonesia, Portugal, Turkey, and Venezuela, have introduced technology or intellectual property transfer requirements.

Many nations have turned to compulsory licenses (CLs) as a specific tactic to transfer know-how and technology to their economies. Compulsory licenses are effectively indirect forms of forced localization. When a country issues a compulsory license, it mandates the transfer of proprietary information (e.g., intellectual property, technology, etc.) to its own domestic manufacturers so that these manufacturers can produce a good in-country. Compulsory licenses thus allow a third party to produce a patented product or process without having the consent of the patent owner.³⁶ Countries most often (though not exclusively) issue compulsory licenses in the case of pharmaceutical products, enabling countries not only to get drugs at a lower price without paying for the costs of drug development, but also to support their own domestic pharmaceutical and biotech industries.

The World Trade Organization's Trade-Related Aspects of Intellectual Property (TRIPS) Agreement inserted a right for developing countries to issue compulsory licenses in the case of extreme health emergencies. And the *Doha Declaration on TRIPS and Public Health*, adopted in 2001, indicates that countries are free to determine the grounds upon which CLs are granted, pursuant to the procedures in Article 31 of TRIPS, namely that:

1. The proposed applicant for the license tried to apply for a voluntary license first, but this was not successful within a reasonable amount of time;
2. Applying for a voluntary license can be bypassed if there is a national emergency, other circumstances of extreme urgency, or the patent is intended for public non-commercial use.

In either case, however, the patent holder still must be paid with "adequate remuneration taking into account the economic value of the authorization." But neither TRIPS nor the Doha Declaration define "adequate remuneration" or "economic value" except to say that it is at the discretion of the member country in which the CL is being issued.³⁷ In addition, the Doha Declaration also changed the initial purpose behind the CL exception to patents. Instead of mainly producing for the domestic market, a CL now allows generic copies to be exported to countries that lack production capacity. In practice, this has allowed transition

economies to benefit at the expense of developed countries by abusing this privilege in order to unfairly acquire foreign intellectual property rights and make money by selling drugs to least developed countries for slightly lower prices.

Countries' Localization Barriers to Trade by Sector

This section analyzes countries' localization barriers to trade in five key sectors: information and communications technology, energy, other durable goods industries, life sciences, and audio-visual services, as well as retail.

Information and Communications Technologies

Countries apply localization barriers to trade on the ICT sector perhaps more than any other, with virtually every type of LBT being imposed on companies competing in ICT industries. However, as summarized in Table 1, the most common forms of LBT seen in the ICT sector are requirements that firms use local infrastructure, such as data centers, in the provision of digital services; local data storage requirements; and local content requirements.

Local ICT Infrastructure Requirements

Local data center requirements mandate that enterprises establish a data center within a country as a condition of being permitted to provide certain digital services in that country. This "data mercantilism" prevents the optimal situation where data can be produced, stored, and processed anywhere. Brazil, China, Indonesia, Malaysia, South Korea, Venezuela, and Vietnam are among the many countries that have imposed or are considering imposing local data center requirements.

| Type of ICT LBT | Selected Countries |
|--|---|
| Local IT infrastructure (such as data center) requirements | Brazil, China, Denmark, Indonesia, Kazakhstan, Nigeria, Norway, Malaysia, Russia, South Korea, Ukraine, Venezuela, and Vietnam |
| Local data storage requirements | Argentina, Australia, Brazil, Brunei, Canada, China, France, Greece, India, Indonesia, Kazakhstan, Malaysia, New Zealand, South Korea, Taiwan, Turkey, Venezuela, and Vietnam |
| Local content requirements | Brazil, China, India, Indonesia, Nigeria, Russia |

Table 1: Countries Imposing or Considering Imposing LBTs on the ICT Sector

For instance, starting September 1, 2013, Vietnam's Decree 72 implements localization requirements mandating that all Internet services companies, such as Google or Facebook, operate at least one data center in Vietnam itself.³⁸ Decree 72's requirement that companies providing Web search portals, cloud computing services, or digital media locate data centers in Vietnam directly violates the country's computer and related services commitments under the WTO GATS Agreement. Likewise, China has implemented local data server requirements purportedly to protect national security and control currency.³⁹

Countries apply localization barriers to trade on the ICT sector perhaps more than any other, with virtually every type of LBT being imposed on companies competing in ICT industries.

In September 2013, Brazil began consideration of a new policy that would require Internet service companies such as Google and Facebook to set up local data storage centers. According to Brazilian Internet Policy Secretary Virgilio Almeida, the Brazilian government may also design the policy to force companies to store sensitive data such as tax information within the country.⁴⁰

Indonesia's draft Local Data Center Law would require all data carriers, including mobile phone providers and foreign banks operating in Indonesia, to field a local data center in the country. As Ashwin Sasongko, Director General for Applications and Informatics with Indonesia's Ministry for Communications and Informatics, explains, "the government policy requiring data center placement within Indonesian borders applies to anyone who runs an electronic system and with transaction activities in Indonesia, whether they are new or existing."⁴¹ Moreover, not only would foreign enterprises be required to set up local data centers to provide digital services, Indonesia's Local Data Center Law would even go so far as to require companies operating in Indonesia (whether domestically or foreign-owned) that use foreign data centers to "switch to Indonesian facilities soon."⁴²

India's government has proposed a measure that would require companies to locate part of their IT infrastructure within the country to provide investigative agencies with ready access to encrypted data on their servers.⁴³ Malaysia has passed a local data server requirements law, although it has not yet implemented it.⁴⁴ And Kazakhstan's Ministry of Communications and Information issued an order requiring that all .kz domain names operate on servers located within the country. Kazakhstan's government later modified this order so that it only applied to new domains.⁴⁵

Russia, Venezuela, and Nigeria have all passed regulations requiring that IT infrastructure for payment processing be located domestically.⁴⁶ Nigeria's Guidelines on Point-of-Sale Card Acceptance Services require that all point-of-sale and ATM domestic transactions be processed through local switches, and forbids the routing of transactions for processing outside the country.⁴⁷ Venezuela has enacted laws that effectively require in-country processing of domestic payment transactions. Similar types of laws are pending in other countries, including Indonesia, Malaysia, and Ukraine. And in South Korea, the country's Financial Services Commission is considering regulations that would require insurers and other financial institutions to maintain servers for housing company financial data in-country and that would restrict transfers of such data outside of South Korea's borders.⁴⁸ This despite the fact that, as the *2013 National Trade Estimate Barriers Report* observes, Korea's strict data privacy rules already effectively require financial services providers to locate their servers physically in Korea.⁴⁹

Local Data Storage Requirements

Beyond establishing laws mandating that foreign enterprises must establish local IT infrastructure in a country in order to provide digital services, a number of countries have also enacted local data storage or local data residency laws. In fact, almost two dozen countries, developed and developing alike—including Australia, Brunei, Canada, China, France, Greece, India, Indonesia, Kazakhstan, Malaysia, New Zealand, South Korea,

Taiwan, Turkey, and Vietnam, among others—have introduced or are actively considering introducing local data storage requirements or onerous data security and data privacy regulations that would create geographic restrictions on where ICT service providers can store and process data.⁵⁰

In many cases, countries link local data storage requirements with local data center requirements. For instance, the Indian government’s proposed measure to require companies to locate part of their ICT infrastructure within the country (to provide investigative agencies with ready access to encrypted data on their servers) would also require that data of Indian citizens, government organizations, and firms hosted on the servers of these companies not be moved out of the country.⁵¹ Likewise, both the Danish and Norwegian Data Protection Authorities have issued rulings to prevent the use of cloud computing services when servers are not located domestically.⁵² In 2010, Norway ruled that cities could not use cloud computing services unless the servers were located domestically. Denmark followed suit in 2011.

However, many countries, or subnational governments within them, have enacted local data storage requirements without additionally requiring that a foreign enterprise establish local ICT facilities such as data centers. For instance, two Canadian provinces, British Columbia and Nova Scotia, have implemented laws mandating that personal information in the custody of a public body—such as primary and secondary schools, universities, hospitals, government-owned utilities, and public agencies—must be stored and accessed only in Canada unless one of a few limited exceptions applies.⁵³ These laws prevent such public bodies in those provinces from using foreign digital service providers in cases where personal information could be accessed from or stored in a foreign country. This effectively constitutes a local data storage requirement that precludes foreign Internet companies from offering cross-border digital services such as cloud computing in those Canadian markets.

In November 2011, Australia’s government presented a bill that would require that local data centers be used in the provision of personally controlled e-health record systems (PCEHRs), which are shared electronic health summaries for Australian citizens that provide a secure electronic summary of a patient’s medical history—including information such as current medications, adverse drug reactions, allergies, and immunization history—in an easily accessible electronic format.⁵⁴ The Australian and Canadian rules on health records have essentially applied a blanket requirement that certain personal data be stored in-country.⁵⁵ Similarly, New Zealand’s Inland Revenue Service issued in 2010 a “Revenue Alert” stating that companies were required to store business records in data centers physically located in New Zealand in order to comply with the Inland Revenue Acts.

Likewise, Greek Law No. 3917/2011, Article 6, which implements the requirements of the EU’s Data Retention Directive, explicitly requires the local storage of data.⁵⁶ The directive requires Internet and telecommunications service providers to retain certain data about a subscriber, largely about their communications by phone and over the Internet.⁵⁷ However, the Greek law goes further than the EU Directive by also requiring that the retained data on “traffic and location” stay “within the premises of the Hellenic territory.”⁵⁸ The

European Commission acknowledges that the Greek law “imposes restrictions on electronic communications service providers regarding the geographic location of data generation and storage, which has an economic effect on these providers and limits their freedom to organize their business.”⁵⁹ In other words, the Greek Law goes beyond the requirements of the EU’s Data Retention Directive by stipulating that the data be retained within the Hellenic territory itself.

In May 2012, France adopted Decree 2010-436, amending an article of the Code of Electronic Communications relating to lawful interceptions. The decree includes a “territorial” restriction that the systems for interception of electronic communications must be established and implemented in France, and encrypted with state-approved technology, if the intercepted data transits outside the jurisdiction. Also, only employees permitted by the state may have access to the relevant systems required for interception and access to the data produced by these systems.

Mandating that data be stored locally has no positive effect on privacy or security.

In Taiwan, the Financial Supervisory Commission (FSC) has promulgated regulations to have most consumer financial institutional data moved and processed “on-shore.” The FSC has since received authorization to enforce the regulation, which calls for financial institutions to comply within four years. In addition, the FSC has established more stringent rules in order for financial institutions to process/move data off-shore.⁶⁰

And in August 2013, the Turkish Telecom regulator passed a regulation (that will come into force on January 1, 2014) that imposes restrictions on the flow of personal data for telecom companies. Because Turkey still lacks a solid legal framework for personal data protection, and the draft personal data protection law is still pending in the parliamentary agenda, it remains to be seen how the Turkish Telecom Authority is going to enforce this new requirement.

In many instances, these laws are motivated by, or at least justified on the basis of, privacy concerns. The belief is that, if data are required to be kept within a country, either it will be more secure or governments will be better able to prosecute those who violate privacy laws. But neither is true. Data are no more likely to be secure or insecure in Canada, Korea, India, or the United States. Data breaches can occur anywhere. And rogue employees can be anywhere. If anything, just as money is more secure in established banks, data are likely more secure in large established cloud providers who are global in scope. The second issue of jurisdiction is just as flawed. The location of servers has absolutely no effect—for good or bad—on privacy, as the local government would still have legal jurisdiction over companies who own the data, regardless of where their data are actually stored. For example, if a hospital in British Columbia stores its data in India and there is a breach due to poor security practices there, the British Columbia government would still have legal authority over the British Columbia hospital. Mandating that data be stored locally has no positive effect on privacy or security.

Local Content Requirements

Local content requirements are commonplace in the ICT sector. As noted, India's Preferential Market Access mandate, if implemented, would require specific local content thresholds for Indian government procurement of telecommunications, electronics, and computing equipment. Brazil is requiring 60 percent local content for the country's deployment of 4G wireless networks, a percentage that will rise to 70 percent by 2016.⁶¹ As in India, the Brazilian National Telecommunications Agency (ANATEL), which is managing the bidding process for Brazil's allocation of its wireless spectrum, has attempted to justify these local content requirements in part on network security grounds—despite the fact that foreign networks, especially in Europe and the United States, are extremely secure. Moreover, as part of the Brazilian government's "IT Maior" strategy, Brazil has promulgated local content requirements for software in government procurement in an effort to boost domestic software development. Specifically, Brazil will require the certification of software as domestic in order to obtain government procurement preferences.

Indonesia's Telecommunications and Wireless Broadband Decree requires all telecom service operators to spend 35 percent of their capital expenditures on domestically manufactured equipment, and requires local content of 30 percent to 50 percent in the wireless broadband sector. It's expected that by 2016 the Indonesian government will require at least 50 percent of telecommunications equipment to be locally sourced. Indonesia's Decree 41 also requires companies to annually report the percentage of local content procured and to have that information "authenticated" by the government or a survey institute appointed by the government.⁶²

In May 2010, Russia issued Directive No. 858, its "Localization Initiative," which tasked Russia's Ministry of Industry and Trade with developing parameters for telecommunications equipment to ensure that all telecommunications equipment sold in the Russian market is manufactured within the territory of Russia. In August 2011, the Ministry of Economic Development and the Ministry of Industry and Trade set the parameters determining what constitutes "domestic telecommunications equipment." The level of production localization in Russia was identified as the main parameter, with the localization level determined by the scope of the research activities and technological operations carried out in Russia, and the desired localization levels set from 60 percent to 70 percent for various types of telecommunications equipment.⁶³

Nigeria has actually imposed localization requirements on digital services through its Oil and Gas Sector Local Content Development Act of 2010.⁶⁴ The Act establishes a Nigerian Content Development and Monitoring Board to enforce requirements for Nigerian content, defined as a specific percentage of total funds spent, labor hours, or input volume, for any operator in the oil and gas sector. For digitally traded services, the Act specifies that 50 percent of the amount spent on ICT management consultancy services must be local. The same is true for data management services, with the figure rising to 60 percent for data and message transmitting services and to 100 percent for general banking, auditing, and life insurance services.⁶⁵

Clearly these nations put local production ahead of having a world class and affordable telecommunications network and IT infrastructure.

Forced Technology Transfer and Joint Ventures

Given the importance of ICT to innovation, many nations now use LBT policies to force technology transfer. China's PRC Telecommunications Regulations stipulate that Internet content services be classified as a value-added telecommunications service. This in turn means companies must not only locate data in-country, but must also sell these services to Chinese customers through a joint venture. Specifically, Chinese regulators appear to be classifying Infrastructure as a Service (IaaS) cloud computing as a "value-added telecommunications service," which in turn means that foreign investment is limited to 50 percent ownership of a joint venture, and that foreign firms can only partner with one of a handful of partners in the state-owned telecommunications industry.⁶⁶ In addition, China's ownership requirements for IaaS cloud computing providers are complemented by regulatory requirements placed on hardware and software deployed in cloud computing centers, including the Multi-Level Protection Scheme (MLPS), Commercial Encryption Regulations, and other regulations concerning the hardware and software to be deployed in establishing IaaS operations.⁶⁷ These myriad regulations place onerous requirements on foreign corporations seeking to provide cloud services and infrastructure in China, including in some cases requiring the disclosure of core source code (a form of technology transfer) and other potentially sensitive information.⁶⁸

Given the importance of ICT to innovation, many nations now use LBT policies to force technology transfer.

India requires that foreign corporations enter into joint ventures to sell products online through e-commerce. Specifically, on September 20, 2012, India's Department of Industrial Policy and Promotion (the "DIPP") issued Press Note 5, which reformed India's foreign direct investment regime in the retail sector by permitting 51 percent FDI under certain conditions in multi-brand retail (in contrast to many nations which allow 100 percent foreign ownership). While this was an important reform that promised higher productivity for India's anemically low-productivity retail sector, unfortunately, among the conditions attached to these new regulatory measures, foreign retailers were prohibited from selling directly to Indian consumers via e-commerce.⁶⁹

India has also pursued forced technology transfer in the ICT sector. For example, India Department of Telecommunications Order No. 10-15/2009-AS-III/193 required service providers to mandate in their contracts that foreign equipment manufacturers transfer all critical equipment and software to Indian manufacturers within three years of signing a purchase order.⁷⁰ Issued in the form of amendments to telecommunications service licenses, the new regulations imposed an inflexible and unworkable security approval process and mandated the forced transfer of technology to Indian companies as well as the escrowing of source code. These measures effectively halted billions of dollars of trade in telecommunications equipment and have since been amended due to significant opposition by foreign governments and industry.⁷¹

Energy

Countries have introduced localization barriers to trade—particularly in the form of local content requirements—that affect all facets of the energy sector, from oil and gas production to the production and deployment of renewable energy technologies such as solar panels and wind turbines.

For instance, Brazil’s government has imposed strict local content requirements on Petrobras, Brazil’s leading oil and gas conglomerate. These apply to the entire supply chain of oil and gas production in Brazil, from equipment to services. Brazil’s government requires 70 percent local content for equipment used in on-shore oil and gas exploration projects; 51 percent for those occurring off-shore in shallow water; and 37 percent for deep-water exploration. As *The Economist* notes, the Brazilian government intends to make these local content requirements “progressively more demanding,” such that by 2017 as much as 95 percent local content will be required for equipment used in oil and gas exploration in Brazil.⁷² Moreover, Brazil’s Oil and Gas Regulatory Framework, introduced in December 2010, requires Petrobras to be the majority operator of new projects, making it responsible for ensuring that its workforce and entire supply chain adhere to these increasingly stringent local content requirements.⁷³ In September 2011, Petrobras was actually fined \$16.9 million for non-compliance with local content requirements, not because Petrobras was a scofflaw, but because the company could not meet the required LCRs without sacrificing quality and safety.⁷⁴

To qualify for the Brazilian Development Bank’s (“BNDES”) FINAME loan program, which provides project finance loans to Brazilian infrastructure investment projects, foreign manufacturers of wind turbines must meet local content requirements of 60 percent. In July 2012, BNDES announced financing disqualification of six foreign wind turbine suppliers for not complying with the 60 percent local content threshold mandated by the FINAME loan program, disqualifying foreign original equipment manufacturers including Acciona Windpower, Clipper, Fuhrländer, Siemens, Suzlon, and Vestas.⁷⁵

China has imposed extensive localization barriers to trade on renewable energy sectors such as wind energy. For instance, China’s National Development and Reform Commission (NDRC) has required 70 percent domestic content for all wind turbines produced in China.⁷⁶ Meanwhile, the 2007 Foreign Investment Industry Guidance Catalogue listed wind turbine manufacturing as an encouraged industry for foreign participation, but foreign firms that manufacture wind turbines capable of producing more than 1.5 MW of power were required to engage in domestic joint ventures or partnerships. For example, Canada-based Xantrex had to enter into a 49 percent minority stake joint venture with Shanghai Power Transmission and Distribution to design and manufacture solar and wind power electronics.⁷⁷ As part of its renewable energy policies, the Chinese government explicitly encourages transfer of wind turbine technology from the foreign to the domestic enterprise.⁷⁸

In August 2013, Mexican President Peña Nieto introduced an energy reform package that includes proposed local content rules in procurement and infrastructure projects in the oil

and gas sector, with the understanding that Pemex, Mexico's largest oil producer, "will finally be compelled to enforce" them.⁷⁹ Indonesia has introduced local content requirements of 50 percent on equipment used in its oil and gas sector. Likewise, Nigeria imposes local content requirements stating that 50 percent of equipment used in its oil and gas services sector must be domestically produced. The law outlines local content requirements for equipment and materials used in oil and gas production and services provision.

India has introduced local content requirements for wind turbines and solar photovoltaic cells (PVs). For wind projects over 10 megawatts (MW) that began operation after January 2012, the Indian government is requiring 50 percent local content. For solar projects between 10 KW (kilowatts) and 10 MW, India requires 60 percent local content. India has further introduced local content requirements for grid-connected solar PV and solar thermal projects. In February 2013, the United States requested WTO dispute settlement consultations with the Indian government concerning the domestic content requirements in India's national solar program.⁸⁰

A number of countries impose domestic content requirements as a condition of renewable energy providers being eligible to receive subsidies and feed-in tariff incentives.⁸¹ For instance, Canadian provinces Ontario and Quebec have required that up to 50 percent and 60 percent, respectively, of renewable energy equipment to be locally sourced in order for the renewable energy provider to be eligible for subsidies and feed-in tariff (FIT) incentives.⁸² In December 2012, WTO judges agreed with complainants European Union (EU) and Japan that provisions of these Canadian programs discriminated against foreign suppliers of equipment and components for renewable-energy generation facilities by affording less-favorable treatment to imported equipment and components than given to like-products originating in Ontario.

But that hasn't stopped other countries from introducing or continuing their own domestic content requirements in renewable energy. Argentina's wind energy law of 2005 stipulated that FIT support be conditioned upon LCR compliance, with LCRs for wind energy reaching 100 percent in 2007.⁸³ India has a similar clause in its feed-in tariff, requiring that solar modules and cells be produced in India to benefit from feed-in subsidies.⁸⁴ Likewise, the Malaysian Renewable Energy Bill of 2010 foresees a variable FIT linked to LCRs.⁸⁵ Multiple Spanish provinces, including Galicia, Navarra, Castile and Leon, and Valencia, impose local content requirements for wind turbines deployed at renewable energy production facilities, with the first two provinces imposing LCRs reaching 70 percent. Starting in 2012, Ukraine began requiring that 15 percent to 30 percent of clean energy technologies be locally sourced in order to receive subsidies from its feed-in tariff program, with these percentages increasing to 50 percent by 2014.⁸⁶ Starting in September 2013, Uganda began to impose local content requirements on the construction of wind farms, stipulating that for foreign bids to be considered, "the domestic inputs that constitute the investment must reach at least 20 percent of the total amount of the investment made for

the construction of the wind farm, regardless of the infrastructure work necessary for their insertion in the energy grid.”⁸⁷ Table 2 summarizes the local content requirements imposed in the renewable energy sector by a number of countries.

| Country/province | Technology | LCR percent (start year), LCR percent (latest year) |
|------------------|------------|---|
| Argentina | Wind | 1999 (10), 100 (2007) |
| Brazil | Wind | 60 (2002), 60 (2012) |
| China | Wind | 20 (1996), 70 (2009) |
| Ontario | Wind | 25 (2009), 50 (2012) |
| Quebec | Wind | 40 (2003), 60 (2012) |
| Spain | Wind | 70 (2012) |
| South Africa | Wind | 35 (2011), >35 (2012) |
| Turkey | Wind | Variable (2011) |
| Uganda | Wind | 20 (2013) |
| France | Solar | 60 (2012) |
| India | Solar | 30 (2011), 30 (2011) |
| Malaysia | Solar | Variable (2010) |
| Ontario | Solar | 50 (2009), 60 (2012) |
| Turkey | Solar | Variable (2011) |
| Ukraine | Solar | 50 (2014) |

Table 2: Incidences of LCRs in Renewable Energy, by Country (Source: Kuntze and Morenhout⁸⁸)

Another local content requirement applied to the renewable energy sector occurs in the form of laws requiring that local service personnel conduct maintenance on wind or solar renewable energy installations. This constitutes localization by forcing foreign service providers to either hire local personnel or lose the opportunity to bid for contracts. As an example, in its 2010 wind energy tender, Uruguay required that 80 percent of maintenance work be sourced locally (in addition to requiring 20 percent equity participation).⁸⁹ A related requirement occurs when nations specify that a certain percentage of national citizens staff projects installing or servicing energy production facilities. For example, Nigeria’s Oil and Gas Industry Content Development regulations stipulate that at least 80 percent of the employees at oilfield services companies must be Nigerian.⁹⁰ As Karl Fessenden, Vice President of General Electric’s Power Generation Services Division, explains, “For those in the energy services sector, forced local content measures appear in

While Chinese law officially contains no local content requirements either regionally or nationally, in practice these requirements have continued informally, especially in the provinces.

the form of laws requiring our workers to be nationals of the country imposing the law or requiring specific procedures to take place within the country.”⁹¹ As Fessenden continues, “Exports of services, unlike goods, often require the establishment of local offices or facilities to be commercially feasible, which means that the right of establishment is critical.” Entry requirements by host nations impede firms such as GE from rapidly deploying these workers and delay the host nation from receiving the services these workers provide. But, as Fessenden notes, “Given the specialized nature of the skills our energy services workers perform to maintain the thousands of products associated with GE’s power generation equipment, it is not economically feasible to hire and sufficiently train skilled workers in each country to respond to the array of situations our workers and customers face at any given time.”⁹² Thus, restrictions on the free flow of workers also constitute a localization barrier to trade.

Forced technology transfer is another localization barrier to trade encountered in the energy sector. For example, Portugal requires any wind company wishing to gain access to its market to partner with a local Portuguese university to conduct clean tech research as a way to more quickly gain technical know-how.⁹³ And while there’s not an overt forced localization element in China insisting that foreign companies must enter into JVs to serve China’s energy marketplace, the reason they have this requirement is so that the domestic company can get at the foreign enterprise’s intellectual property.⁹⁴

Other Durable Goods Industries

Countries have imposed a variety of localization barriers to trade on a range of durable goods industries, from iron and steel to automobiles, auto parts, high-speed rail equipment, and defense products. Local content requirements; forced technology transfer, often through mandated joint ventures; and forced offsets are most common to durable goods industries.

Local Content Requirements

Brazil’s *Plano Brasil Maior* (Larger Brazil) strategy has introduced a minimum local content requirement of 65 percent for Brazil’s automotive sector (in addition to required investments in local R&D) if the automakers are to be eligible to qualify for significant tax breaks. This local content level is to be gradually increased over the coming years. In fact, government officials have declared that the goal is to reach close to 100 percent of local content in Brazil’s automotive industry.⁹⁵

Officially, Chinese law contains no local content requirements either regionally or nationally in any sector, as Chinese bureaucrats have worked to remove all WTO-forbidden local content requirements from official legislation in the wake of China’s accession to the WTO in 2001.⁹⁶ But as Usha and George Haley write in *Subsidies to Chinese Industry: State Capitalism, Business Strategy, and Trade Policy*, the reality is that in many industries, “local content requirements continued officially and informally, especially in the provinces, as *Neibu*—undisclosed rules for the approval of foreign-investment projects.” These *Neibu* exist alongside *Gongkai*, or public regulations. As they write with respect to the auto industry:

For autos and auto parts, project loans from Chinese policy banks and provincial governments have become contingent on foreign companies' willingness to commit to local content. Reports refer to a secret 60-percent rule under which foreign companies must have 60 percent local content to obtain state grants, bank loans, and even access to provincial markets.⁹⁷

Moreover, foreign auto assemblers have to fulfill product feasibility requirements, and Chinese government officials have classified foreign companies' new products as unfeasible for failing to honor any part of the local content agreements they had signed. As an official involved in drafting the rules on foreign companies' new-product-feasibility reports commented: "In the feasibility report on a new product, localized production is a core requirement."⁹⁸

The array of barriers and incentives in China's automobile parts industry, coupled with high tariffs on automobile parts, have compelled foreign auto and parts makers to produce in China rather than export assembled autos or parts from their home countries.⁹⁹ As Gary Hufbauer and colleagues at the Peterson Institute for International Economics note, "On average, each Chinese-made car contains \$1,155 worth of imported auto parts... This figure is considerably below the average for countries that have virtually free trade in auto parts."¹⁰⁰ In fact, the United Kingdom has almost ten times the imported auto parts content per vehicle (\$10,853) that China does, while Canada (\$9,156) has over eight more, and Mexico (\$6,638) six times more.¹⁰¹

These types of policies also pervade regional and provincial level in China. As *Global Trade Alert* notes:

There have been reports that a number of eastern coastal provinces in China are giving priority to locally manufactured products (e.g., automobiles and home appliances) for local procurement and purchases and requiring companies to source raw materials or equipment locally... Many of these 'encouragements' seem to be made through personal contacts rather than communicated through written form.¹⁰²

Indeed, Chinese governments (nationally and provincially) have become masters at enacting LBTs in ways that are never put down on paper so that prosecution can prove difficult.

For its part, Russia's "Localization initiative" also applies to its automobile sector. On April 15, 2005, the Russian government began to implement a program to promote domestic auto production. Under the program, auto producers located in Russia that produce at least 25,000 vehicles annually, used at least 30 percent local content, and perform welding, painting, and assembly operations within their Russia-based operation qualify for reduced import duties on imported components. As of February 2011, the requirements were increased to include: a minimum of 350,000 vehicles produced annually; 60 percent local

content; stamping operations as part of the locally based production process; and the establishment of R&D centers in Russia to perform engineering, design, and testing of vehicles and parts.¹⁰³

Forced Technology Transfer

Foreign enterprises in capital goods industries encounter a range of forced technology transfer requirements in countries such as China. For instance, The Ford Motor Company opened a number of automobile factories in China, but was required to do so as part of a JV with Chinese automobile producer Chang'an Motors.¹⁰⁴ Moreover, the Chinese government required Ford to open an R&D laboratory employing at least 150 Chinese engineers. When Ford sought to build a second factory nearby, again the requirement was to build a second R&D facility. Volkswagen encountered a similar experience. Only after the company promised to build an electric car with a Chinese company was it allowed to build a new factory in Foshan.¹⁰⁵

The Chinese government has used forced technology transfer to help build its advanced electric vehicle industry. In accordance with its “New Energy Vehicles” plan, China requires foreign electric vehicle makers to transfer IP to a Chinese automaker as a requirement for gaining access to the market.¹⁰⁶ A recent case involved General Motors (GM) trying to gain access to China’s 50 percent tax credit for electric vehicles, which domestic firms already have access to; GM couldn’t access the credit for its Chevy Volt without first attaining permission from the Chinese government. While in negotiation, the Chinese government began placing “heavy pressure on the company to transfer one of the Volt’s three core technologies to a joint venture with a Chinese automaker.”¹⁰⁷ GM eventually balked, but one of its competitors, Ford, plans to accede to China’s technology transfer demands in order to qualify for the consumer credit.¹⁰⁸

The development of China’s high-speed rail market provides another example of China using forced technology transfer in conjunction with forced joint venture investment requirements. In early 2009, the Chinese government began requiring foreign companies wanting to bid on high-speed railway projects to form joint ventures with state-owned equipment producers CSR and CNR. Not willing to just import the trains and equipment, China stipulated that multinational companies could hold only a 49 percent equity stake in the new companies, that they had to offer their latest designs, and that 70 percent of each system had to be made locally. Competing foreign rail manufacturers including France’s TGV, Germany’s Siemens, and Japan’s Kawasaki had no choice but to go along with these stipulations, even though they realized that their joint venture partners would soon become their rivals outside China.¹⁰⁹ The winning bidder, Kawasaki, had to develop the local supply chain for train components and train the Chinese engineers—including by sharing their entire know-how and catalogue of technologies and even bringing Chinese engineers to its Japanese manufacturing facilities for training. While the foreign multinationals are still importing the most sophisticated components, such as traction motors and traffic-signaling systems, today they account for less than 20 percent of China’s high-speed rail market.¹¹⁰

Though historically used primarily in the aerospace and defense industries, some governments have recently expanded the use of forced offsets beyond these two areas into broader public procurement activities.

China's *Steel and Iron Industry Development Policy* (Steel Policy), introduced in July 2005, requires that foreign enterprises seeking to invest in Chinese iron and steel enterprises possess proprietary technology or intellectual property in the processing of steel.¹¹¹ As the United States Trade Representative Office's 2013 *National Trade Estimate Barriers Report* explains, "Given that foreign investors are not allowed to have a controlling share in steel and iron enterprises in China, this requirement seems to constitute a *de facto* technology transfer requirement."¹¹² Of course, this statement could apply equally for all the other industries in which China imposes joint venture requirements, from autos, to high speed rail, to cloud computing service providers.

Forced Offsets

Another common forced localization policy in the manufacturing sector is forced offsets. Forced offsets are industrial compensation arrangements required by foreign governments as a condition of public procurement (and sometimes private procurement) contracts. Forced offsets are encountered most commonly in public procurement in the aerospace and defense industries. For example, Austria, Greece, Lithuania, India, Israel, Romania, Oman, Saudi Arabia, Turkey, the United Kingdom, and the United Arab Emirates, among others, continue to require offsets as a condition for the awarding of defense contracts. In Austria, for example, offset requirements can reach up to 200 percent of the value of the contract for major defense purchases.¹¹³ So despite the fact that the United States leads the world in terms of defense technology and production—in large part by serving as the global policeman defending scores of other nations who make little investment in their own defense—the United States gets less economic benefit from this production because so many nations subject U.S. defense contractors to offsets as a condition of sales.

Some of these are new policies added to a nation's mercantilist toolbox. For example, India established its defense offset policy in 2005. Its program requires companies to invest 30 percent or more of the value of contracts greater than \$67 million in Indian-produced parts, equipment, or services. And in the future, this number is likely to increase. India's projected \$20 billion purchase of 126 fighter aircraft is expected to specify a 50 percent offset.¹¹⁴

Though historically used in the aerospace and defense industries, some governments have recently expanded the use of forced offsets beyond these two areas into broader public procurement activities. For instance, India recently expanded its use of offsets to include civil aviation, and "has indicated that it is considering broadening the areas of acceptable offsets."¹¹⁵ In other words, India is going to require that aerospace companies such as Airbus and Boeing produce aerospace parts and components in India as a condition of selling aircraft to Indian airlines. Offsets have long been at least an implicit part of Boeing's aircraft sales to Japanese airlines, including All Nippon Airways (ANA) and Japan Airlines.

BOX 1: IS AMERICA GUILTY TOO?: A HISTORY OF BUY AMERICA POLICIES

It's not uncommon for officials from other nations, when confronted with their government's localization trade barriers to respond by pointing to the United States' own "Buy America" provisions as if the latter justify the former. But, as this section makes clear, normally the two are not equivalent.

In 1933, Congress passed the *Buy American Act*. The act, signed by President Hoover on his last full day in office, required the U.S. federal government to prefer U.S. products for all purchases over the micro-purchase threshold, but not services. Under the Act, all goods for public use (articles, materials, or supplies) must be produced in the United States, and manufactured items must be manufactured in the United States from U.S. materials. 1933 Buy American creates a price preference that favors "domestic end products" from American firms in U.S. federal government contracts for:

- Unmanufactured products mined or produced in the United States;
- Manufactured products in which the cost of its U.S. components exceeds 50 percent of the cost of all components of the item and the product is manufactured in the United States.

The Buy American Act of 1933 is also known (in addition to the Smoot-Hawley Tariff Act) as one of the factors worsening the Great Depression for Americans because of its shortsighted approach to the growth fostered by free trade.

Currently, the President has the authority to waive the *Buy American Act* within the terms of a reciprocal trade agreement. Agreements that fall under this include the 1979 General Agreement on Tariffs and Trade Government Procurement Code, the U.S.-Israel Free Trade Agreement, the North American Free Trade Agreement, and the World Trade Organization's Agreement on Government Procurement (GPA). Of these, the *Buy American Act* is officially excluded from the GPA's coverage. In practice, this means that in order for foreign goods to be purchased by the U.S. government, an exception must be posted to the Federal Register and the comparable domestic good must fall under one of three waivers:

- Inconsistent with the public interest.
- Insufficient or reasonably unavailable quantities of the domestic product or its quality are unsatisfactory.
- Costs 25 percent more than its foreign counterpart.

The Buy America Act was a provision of the Surface Transportation Assistance Act of 1982. Buy America provisions are applied to transit-related procurements valued over \$100,000, for which funding includes grants administered by the Federal Transit Authority (FTA) or Federal Highway Administration (FHWA). In comparison to the 1933 legislation, Buy America is intended to specifically apply to manufactured products—like iron and steel—while Buy American is intended to apply to over 100 different procurement products. Thus, all federal-aid construction projects must either require no permanently incorporated steel and/or iron materials, or require that all steel and iron materials used in the project be manufactured in the United States. "Manufactured in the United States" means that all manufacturing processes starting with the initial mixing and melting through the final shaping and coating processes must be undertaken in the United States. The only exceptions permitted are:

- If the State permits alternate bids for foreign vs. domestic steel and iron materials, and the total bid for the contract using foreign steel and iron materials is lower by more than 25 percent than the total bid using domestic source materials;
- If the amount of foreign steel and iron materials is minimal, meaning it does not exceed 0.1 percent of the total contract value, or \$2,500, whichever is greater; or
- If the FHWA approves a state-requested waiver to permit use of foreign steel and/or iron materials.

In 2009, the *Buy American Provision of the American Recovery and Reinvestment Act* (ARRA) imposed a general requirement that any public building or public works project funded by the new stimulus package must use only iron, steel, and other manufactured goods produced in the United States. Unless one of three listed exceptions applies (non-availability, unreasonable cost, and inconsistent with the public interest) and a waiver is granted, none of the funds appropriated by or made available by the ARRA can be used for a public works project unless all the materials in the project are produced in the United States. Of the \$787 billion authorized by the one-time stimulus, these restrictions applied to approximately \$275 billion of procurements.¹¹⁶ Thus, it is important to note that the Buy American Provision will only last as long as the \$275 billion lasts, while Buy American of 1933 and Buy America of 1982 are permanent pieces of legislation. In addition, in order to qualify for an unreasonable cost waiver, the use of a U.S. domestic product must increase the total cost of the project by 25 percent (as opposed to the domestic component costing 25 percent more).

According to *The Washington Post*, the *Buy American Provision* caused outrage in the Canadian business community, and Canada retaliated by creating a similar proposal that would shut out U.S. bidders from Canadian city contracts.¹¹⁷ In 2010, the United States and Canada agreed to exempt Canada from the Buy American Provision.

In summary, though the United States does have LCRs in government procurement in a couple of sectors—which the United States does indeed need to repeal—not all policies are created equal. The U.S. LCRs do not apply to private sector procurements. Moreover, the ARRA provisions will expire in several years, while the other two—the *Buy America Act* and the *Buy American Act*—are capable of being waived within the context of free trade agreements (and indeed have been waived many times).

In fact, 35 percent of Boeing’s new wide-body aircraft, the 787 Dreamliner, will be manufactured in Japan.¹¹⁸ In Turkey, multiple constituencies are calling for the use of offsets as part of Turkish Airlines’ impending purchase of 252 new aircraft.

Though historically used in the aerospace and defense industries, some governments have recently expanded the use of forced offsets beyond these two areas into broader public procurement activity. For instance, India recently expanded its use of offsets to include civil aviation, and “has indicated that it is considering broadening the areas of acceptable offsets.”¹¹⁹ In other words, India is going to require that aerospace companies such as Boeing and Airbus produce aerospace parts in India as a condition of selling aircraft to Indian airlines. Offsets have long been at least an implicit part of Boeing’s aircraft sales to

airlines in Japan, including All Nippon Airways (ANA) and Japan Airlines. In fact, 35 percent of Boeing's new wide-body aircraft, the 787 Dreamliner, will be manufactured in Japan.¹²⁰ In Turkey, multiple constituencies are calling for the use of offsets as part of Turkish Airlines' impending purchase of 252 new aircraft.

Israel, which receives over \$3 billion per year from the U.S. government in economic and military assistance, implements its broad offset requirements through international cooperation (IC) agreements, under which foreign companies, including U.S. companies, are required to offset government contracts by agreeing to invest in local industry, co-develop or co-produce with local companies, subcontract to local companies, or purchase from Israeli industry. Israel's use of offset provisions has soared, from \$320 million in 2009 to nearly \$1 billion in 2011.¹²¹ As of January 2009, the offset percentage for procurements covered by Israel's GPA obligations accounted for 20 percent of the value of the contract, while for procurements excluded from GPA coverage—including most military procurements—the offset equaled 35 percent.¹²² And in Saudi Arabia, under a 1983 decree, contractors must subcontract 30 percent of the value of any government contract, including support services, to firms that are majority-owned by Saudi nationals.¹²³

Argentina has recently introduced export equalization measures as a new form of forced offset. Argentina's government requires some manufacturers to match every dollar worth of products they import to the country (such as component parts) with a dollar of exports.¹²⁴ The requirements force sellers of foreign-made cars, for example, to become exporters of everything from bio-diesel to bottled water in return for access to Argentina's auto market.¹²⁵ In order to comply, Porsche importer Hugo Pulenta has been forced to ship malbec wines from Argentinean vineyards to offset imports of Porsche vehicles, while Mitsubishi Motor Corp. has elected to export peanuts.¹²⁶ Other industrial manufacturers have been forced to become exporters of Argentinean agricultural products to comply.

Life Sciences

Partly because pharmaceuticals and medical devices are purchased and/or heavily regulated by governments in most nations, they are a ripe target for LBTs. For example, both Indonesia and Russia have introduced local content requirements in the life sciences industry. Indonesia's Ministry of Health Decree No. 1010/MENKES/PER/XI/2008 requires foreign pharmaceutical companies to manufacture locally or entrust a company already registered as a manufacturer in Indonesia (a potential competitor) to obtain drug approvals on their behalf. Further, Decree 1010 requires local manufacturing in Indonesia of all pharmaceutical products that are five years past patent expiration.¹²⁷ Indonesia's Decree 1010 also contains technology transfer requirements for pharmaceutical products. Russian government officials have called for more local production of pharmaceuticals, including those with foreign active ingredients and formulations. In particular, the Russian government has drafted proposed legislation that would restrict public procurement to domestic drugs in cases where there are two or more domestically produced medicines within the same product category available.¹²⁸ The Russian government's long-term

pharmaceutical industry development plan calls for Russian manufacturers to account for at least 50 percent of total sales (based on value) by 2020 and to have 90 percent of strategically important medicines produced in Russia by 2018.¹²⁹

Brazil has likewise implemented measures to force localization of foreign pharmaceutical production. For example, starting in 2012, Brazil's public procurement policies began to strongly encourage domestic pharmaceutical production by establishing price preferences of up to 25 percent for Brazilian medical technologies and medications in government contracts—a policy that forces foreign enterprises to produce locally if they want their biopharmaceutical products or medical technologies to be competitive in Brazil's public procurement market.¹³⁰

Life sciences industries are also adversely affected by the compulsory licensing of intellectual property, which in effect “forces the localization” of a foreign enterprise's intellectual property to competitors in another country. The original concept behind creating compulsory license provisions was to enable governments to produce generic drugs for public health care purposes in extraordinary situations of extreme urgency or other national emergency and for these drugs to be used to serve the country's domestic market, and not for export purposes.¹³¹ But several countries have begun to issue compulsory licenses on grounds and for purposes well beyond the original intent for compulsory licenses as articulated in the *Doha Declaration on the TRIPS Agreement and Public Health*. In these cases, compulsory licenses are being used by countries as a means to obtain or transfer technology developed by others in order to build up domestic industry without having to pay the cost associated with developing and testing the product.¹³²

Compulsory licenses are being used by countries as a means to obtain or transfer technology developed by others in order to build up domestic industry without having to pay the cost associated with developing and testing the product.

For instance, on March 9, 2012, the Indian Patent Controller General granted a compulsory license to Natco, an Indian pharmaceutical company, enabling it to produce a patented cancer drug (Nexavar, or sorafenib tosylate) made by Bayer.¹³³ The Controller ruled against Bayer on three counts, including one contending that the patent was not “worked” (i.e., exercised) to the fullest practical extent in India because it was not manufactured there—a policy decision that discriminates against imports in violation of India's international obligations. As the United States Trade Representatives' Office 2013 *Special 301* report noted with regard to the ruling:

India's decision to restrict patent rights of an innovator based, in part, on the innovator's decision to import its products, rather than manufacture them in India, establishes a troubling precedent. Unless overturned, the decision could potentially compel innovators outside India—including those in sectors well beyond pharmaceuticals, such as green technology and information and communications technology—to manufacture in India in order to avoid being forced to license an invention to third parties.¹³⁴

India has also considered issuing compulsory licenses for three additional drugs.¹³⁵ The additional compulsory licenses are being considered on the same specious grounds that contributed to issuance of the compulsory license for Nexavar, namely that: 1) the drug

prices are too high; 2) the domestic market has not been adequately supplied; and 3) the drug is not being manufactured sufficiently in India. (This pressure from the Indian government contributed in early August 2013 to Roche deciding not to attempt to maintain its patent for Herceptin in India.)¹³⁶ Worse, India's issuance of compulsory licenses will only encourage other nations to follow suit. For instance, although China has not yet granted any compulsory licenses on biopharmaceutical products, it "has announced an intention to do so in the future."¹³⁷ And a Draft National Policy on Intellectual Property issued by South Africa in September 2013 proposes using compulsory licensing both as a bargaining tool in price negotiations with producers of innovative medicines, as well as a means to promote technology transfer to South Africa.¹³⁸

Elsewhere, Ecuador has issued several compulsory licenses for patented pharmaceutical products developed by foreign manufacturers.¹³⁹ For example, in 2010, Ecuador's Intellectual Property Institute imposed a compulsory license on a patented drug manufactured by a U.S. company for the treatment of HIV/AIDS. This license was issued based on a Presidential Decree in 2009 that established a special procedure for granting compulsory licenses on medicines designated as "public health priorities." The same decree made a blanket assessment that most innovative medicines are "public health priorities." Likewise, Egypt's issuance of a compulsory license for an erectile dysfunction drug hardly meets the urgent public health needs imagined by TRIPS.¹⁴⁰ Nor do the compulsory licenses that Argentina and Taiwan issued in 2005 for patents needed to manufacture and sell generic versions of the flu drug Tamiflu meet TRIPS parameters.¹⁴¹ These are all just additional examples of nations using whatever loopholes and excuses they can for limiting imports.

Audio-visual Services

Local content requirements and other localization barriers to trade are particularly prevalent in the audio-visual sector (e.g., movies and television) among developing and developed nations alike. While localization barriers to trade in the audio-visual sector are often justified by vague and undefined "cultural" concerns, the reality is that the protectionism, distortions, and limits on consumer choice involved are just as real and damaging as they are when applied to barriers on data or physical goods. Moreover, to the extent that these "culture"-based localization barriers are justified by theories of scarcity (e.g., a limited number of movie screens; a limited number of TV stations each with a limited number of broadcast hours), or by theories of the need to counterbalance the content choices pushed on consumers by a limited number of "gatekeepers" (e.g., TV stations; theater owners), these rationales are increasingly untenable. New offerings and new technology, such as 500-channel Pay TV services and DVRs that effectively eliminate the concept of "prime time," and new business models enabled by the Internet, as well as an explosion of new content, have eliminated scarcity and significantly eroded the influence of the traditional media "gatekeepers." The Internet has unlimited "shelf space." Nonetheless, like many other regulations that have long outlasted their underlying justification, localization barriers in the audio-visual services sector continue. In some cases, countries are even trying to extend these barriers to the Internet, limiting consumer

Localization barriers to trade harm not just the nations whose firms put production there in response, but third party nations that might otherwise have received that investment.

choices, promoting content theft, and slowing the growth of these services. Indeed, since audio-visual content is such a huge driver of broadband demand, these barriers could even slow the growth of investment in broadband.¹⁴²

Localization barriers in the audio-visual services space typically fall into two categories: local content quotas, and localization requirements in terms of where or by whom the content is produced or owned.

Among developing nations, Argentina's Law 26.522 regarding audiovisual communication services will require minimum national content of 60 percent to 70 percent, set a minimum screen quota for Argentine movies, and impose a fee on foreign programmers in the amount of 0.5 percent of annual revenue for acquiring Argentine films.¹⁴³ Brazil requires that 80 percent of the programming aired on "open broadcast" television channels be produced in Brazil.¹⁴⁴ Also, per Brazil's Law 12.485, all pay television channels in Brazil are required to broadcast at least 3.5 hours of Brazilian programming per week during prime time hours. Implementing regulations for the law modified the pre-existing definition of what constitutes Brazilian programming, requiring as one condition that a majority of the intellectual property be owned by a Brazilian.¹⁴⁵ Additionally, in any television subscription plan offered in Brazil, providers are obligated to include at least one Brazilian channel for every two foreign channels offered.¹⁴⁶

In China, foreign content must not exceed 30 percent of daily programming on pay TV channels, and foreign channels may not be retransmitted in their entirety (with an exception for certain channels approved for tourist hotels and certain channels in the Guangdong province).¹⁴⁷ China bans all foreign content, including animation, from 7 to 10 p.m. on terrestrial TV.¹⁴⁸ In addition to capping the number of revenue-sharing foreign films allowed per year to 34, China also requires theaters to ensure that Chinese films account for at least two-thirds of total annual screen time.¹⁴⁹ China also requires importers of animation programs to produce a like amount of domestic animation.¹⁵⁰ In Indonesia, pay-television operators are by law required to broadcast 20 percent local channels.¹⁵¹ Malaysia maintains a plethora of LBTs in the audio-visual services sector—80 percent of broadcast television programming must originate from local production companies owned by ethnic Malays, and 60 percent of radio programming must be of local origin.¹⁵² Moreover, Malaysia imposes a "Made in Malaysia" requirement on advertisements aired on free and pay television, requiring that they be produced in Malaysia, using Malaysian citizens, with no more than 20 percent footage or productions costs from outside Malaysia; the government may provide exemptions covering no more than 30 percent of total advertising on a channel.¹⁵³ Also, as a condition for obtaining a license to operate in Malaysia, video rental establishments are required to have 30 percent local content in their inventories.¹⁵⁴ For its part, in 2011, Vietnam passed a law requiring that all advertising shown on pay TV in Vietnam be produced in Vietnam.¹⁵⁵ Importantly, Malaysia and Vietnam are both Trans-Pacific Partnership parties, and these localization barriers should be addressed in those negotiations.

But local content requirements in the audio-visual services sector are not limited to developing nations. Australia's Broadcasting Services Amendment Act requires subscription television channels with significant drama programming to spend 10 percent of programming budgets on new Australian drama programs.¹⁵⁶ And 55 percent of air time on free television channels between 6am and midnight must be Australian-made.¹⁵⁷ France has implemented some of the world's most restrictive audio-visual localization barriers. For example, France requires that 60 percent of broadcast television programming and 60 percent of broadcast feature films be European Union-originated, and two-thirds of those quotas must be specifically of French origin.¹⁵⁸ Meanwhile, Internet, cable, and satellite networks may reduce their EU content quotas to 50 percent EU content (the European Audio-Visual Media Services, or AVMS, Directive minimum), and 30 to 35 percent French-language product, by making required minimum investments in French-language productions.¹⁵⁹ As reflected in efforts to limit the EU's negotiating mandate in the Transatlantic Trade and Investment Partnership (T-TIP) negotiations with the United States, France and other European countries are also examining ways to extend these localization barriers to trade into the Internet.¹⁶⁰

In South Korea, foreign retransmitted channels are capped at 20 percent of each operator's portfolio.¹⁶¹ Beyond that limit, channels must enter into joint ventures with Korean operators for transmission as "local" channels, which are then subjected to mandatory local content quotas ranging from 25 to 60 percent depending on genre.¹⁶² South Korea also maintains a quota requiring movie theaters to show domestic films a minimum number of days per year.¹⁶³ And in Taiwan, cable providers must include at least 20 percent local programming in their offerings.¹⁶⁴

Retail

Because it involves less public procurement or regulation, LBTs applied to the retail sector are not as predominant as they are in other sectors. But they do exist. For example, India applies local content requirements to its retail sector. India's FDI policy document states, "At least 30 percent of the value of procurement of manufactured/processed products purchased shall be sourced from Indian "small industries" which have a total investment in plant & machinery not exceeding \$1 million."¹⁶⁵ This condition is also mandatory for single-brand retail investors (such as Gucci and Ikea) if they invest beyond 51 percent. But just a few days after making the policy announcement, India's government diluted the LCR clause under pressure from foreign retailers, allowing them to meet this requirement over a five-year period. This is a continuation of a long tradition of post-war Indian economic policy that perversely sought to favor small firms, with the only result being tragically low productivity and incomes for Indian citizens. (See Appendix A)

WHY LOCALIZATION BARRIERS TO TRADE ARE HARMFUL

For many decades global trade and investment grew faster than global GDP as economies and firms became globally integrated. However, since the financial crisis, both are growing

more slowly than global GDP.¹⁶⁶ And one key reason for this has been the rapid growth in countries' use of localization barriers to trade. But LBTs don't just slow trade, they fundamentally harm economic growth.

LBTs are economically harmful for three fundamental reasons. First, they hurt the economies not using them, lowering growth and often in turn encouraging LBTs in response. Second, they hurt the global economy, particularly by lowering the amount of innovation. Third, while LBTs are intended to benefit the countries that field them, in reality they can backfire and hurt their own economic growth.

Localization Barriers to Trade Damage Economies Affected by Them

When a nation requires local production as a condition of market access, it harms not just the nations whose firms put production there in response, but third party nations that might otherwise have received that investment.

With regard to the former, to the extent that LBTs lead to facility closures, cutbacks, or diminished expansions in the home nations, they hurt economic growth at least in the short- and medium-term. Unemployment will increase (or not decrease as much), imposing costs not just on workers, but also on governments. And the firms being forced to localize are hurt because their cost structure goes up: if it made economic sense to localize production in the destination country, they would have already done so. Thus, by definition, coerced local production raises firms' costs, meaning lower profits and less investment in their home nations. To the extent localization barriers limit market access completely, they limit firm growth, resulting in fewer jobs and lower profits. Finally, by serving as a headwind against growth, such diverted investment lowers the rate of overall growth.

Some will argue that the only costs are short-term transition costs and that nations will easily rebound from these one-time "shocks." But this overlooks three key points. First, if these are "shocks" they are ongoing sustained shocks that continue to have impacts over the years, as LBT policies have continuous impacts. Second, even if the costs are transitory and economies rebound and end up performing other work, the costs are real and are paid for by society. Finally, as ITIF argues in *Innovation Economics: The Race for Global Advantage*, if such shocks are large and sustained enough they can have long-term effects on economies, distorting investment patterns to create bubbles (e.g., the U.S. housing bubble) and reducing overall investment, leading to a self-reinforcing pattern of decline, not rebound.¹⁶⁷

LBTs also affect third party nations. For example, China's extensive use of LBTs has distorted global trade and investment patterns and significantly hurt other developing nations, such as Brazil and India, that might otherwise have received some of the investment and gained some of the global market share. Not only has this meant slower economic growth in these third-party nations, more troublingly it has encouraged these nations to ramp up their own LBTs in response. Their thinking appears to increasingly be "if you can't fight em, join em." Moreover, as they see nations like China contravene the

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rules and spirit of the global trading system with general impunity, undermining confidence in trade's ability to produce globally shared prosperity, they see the risks of retaliation from embracing LBTs as minimal. Consequently, the global trade system decays and devolves into a competition where every country is incentivized to cheat, the competition becomes cutthroat, and the global economy suffers.

Localization Barriers to Trade Damage the Global Economy

But localization barriers to trade do not just hurt the economies whose firms are on the receiving end of them; they hurt the entire global economy, particularly by leading to relatively less innovation produced by innovation-based industries such as information and communication technologies, clean energy, life sciences, aerospace, and scientific instruments.

Innovation industries have three key characteristics. First, they feature rapid and regular development of new processes, products, or services—many of them disruptive in nature—which is critical to their competitive advantage. For example, the success of industries such as biotechnology and semiconductors depends not on making a particular drug or semiconductor cheaper, but on bringing to market a new one.

The second key component of innovation-based industries is that their marginal costs are significantly lower than their average costs. The software industry provides an example of this dynamic. It can cost hundreds of millions of dollars to produce the first software program, but additional copies can be produced at virtually no cost. Yet even “atom-based” industries, like aerospace and life sciences, can have declining marginal costs. For example, Boeing invested almost eight years of development work and an expenditure of over \$15 billion dollars before a single 787 Dreamliner was sold.¹⁶⁸ That \$15 billion dollars must be built into the overhead of every 787 that Boeing sells. Thus, these industries experience what economists call increasing returns to scale. But not all industries have this characteristic. A study by the European Commission of over 1,000 European companies found increasing returns to scale for high-tech firms, but decreasing returns to scale for low-tech ones.¹⁶⁹

Finally, innovation industries depend more than other industries on intellectual property. For example, software depends on source code; life sciences on discoveries related to molecular compounds; aerospace upon materials and device discoveries. That's why the European Commission study found that for non-high-tech firms the contribution of knowledge capital to success was lower than the contribution of physical capital, but for high-tech firms it was higher.¹⁷⁰

These three distinct characteristics of innovation industries—the need for constant innovation, high fixed costs relative to marginal costs, and dependence on intellectual property—make localization barriers to trade particularly damaging to them. To understand why, it's important to examine the market conditions that maximize innovation in innovation industries.

Internationally, maximizing innovation by innovation industries depends upon three factors: 1) ensuring the largest possible markets; 2) limiting non-market-based competition; and 3) ensuring strong IP protection. All three factors get to the core challenge for innovation industries: investment in innovation is uncertain and therefore higher than normal profits on the innovations that actually succeed are needed. True innovation is not about risk in the sense that the likelihood of success can be more or less modeled accurately. Innovation is about uncertainty that cannot be modeled, as reflected by the fact that Thomas Watson, the chairman of IBM, predicted in 1943 that, “I think there is a world market for maybe five computers.” Because innovation is about uncertainty, failure is often rampant. In fact, only 8 percent of innovation projects exceed their return on investment (ROI) hurdle rate, while only 12 percent of R&D projects exceed their cost of capital.¹⁷¹ For every Apple succeeding with an iPad, there are ten companies that fail. Moreover, innovation industries face not just loss of market share from competition, but loss of existence. This reality evokes Joseph Schumpeter’s dictum that “every piece of business strategy must be understood against the perennial gale of creative destruction.”¹⁷²

This is why, for innovation industries, so-called Schumpeterian profits are so critical. These are profits that arise when firms are able to appropriate the returns from innovative activity. For if firms are assured at best of only normal returns from successful innovation, no innovator would take the enormous risk of investing in innovation. Moreover, because innovation is so expensive, higher returns enable companies to invest more in R&D and other innovation-based activities. Innovative industries depend on the profits from one generation of innovation to then reinvest back into the expensive R&D needed to finance development of the next generation of innovation. This explains why the two industries with the highest expenditures on R&D as a percentage of sales in the United States are semiconductors and biopharmaceuticals.¹⁷³ And this cycle has to continue over time. If it breaks at any point, the entire innovation process becomes stillborn.

Because localization barriers to trade compromise innovators’ ability to realize profits that can then be reinvested back into the next generation of expensive and risky innovation, they risk undermining the entire life cycle process of innovation in innovation-intensive industries. This is why access to large markets, no excess competition, and strong intellectual property protections are vital for innovative industries to thrive. Unfortunately, localization barriers to trade imperil each of these three conditions.

Market Balkanization Prevents Large Markets

Because most innovative industries are characterized by relatively high fixed costs of initial R&D and design but relatively lower marginal costs of incremental production, innovation industries need access to large, global markets, which better enables them to cover their high fixed costs, so that unit costs can be lower and revenues for reinvestment in innovation higher. This is why enterprises in most innovation industries are global. If innovative industries can sell in twenty countries rather than five, expanding their sales by a factor of four, their costs increase by much less than a factor of four. This is why numerous studies have found a positive effect of the ratio of cash flow to capital stock on the ratio of R&D investment to capital stock.¹⁷⁴ The more sales, the more revenue can be plowed back

The three distinct characteristics of innovation industries—the need for constant innovation, high fixed costs relative to marginal costs, and dependence on intellectual property—make localization barriers to trade particularly damaging to them.

into R&D to generate more innovations. This is also why the European Commission study found that for high-tech firms, “their capacity for increasing the level of technological knowledge over time is dependent on their size: the larger the R&D investor, the higher its rate of technical progress.”¹⁷⁵

However, countries’ trade-distorting policies, such as LBTs, lead to market balkanization that limit scale economies at both the firm and establishment level (establishments being particular geographic units of individual firms). Firm-level barriers limit market access to foreign firms in favor of domestic firms and raise global innovation costs by enabling more firms in any particular market than necessary. These barriers stem from policies that favor domestic innovation firms over foreign ones. For instance, telecom companies can be frozen out of big foreign markets if governments adopt specific national product standards that differ from prevailing global standards.¹⁷⁶

Establishment-level barriers—such as India’s Preferential Market Access policy—allow foreign firms to access markets, but compel them to locate establishments (e.g., production facilities) in the market. These barriers lead to an increase in the number of establishments, which can increase global production costs. Likewise, ICT firms may only need a few data centers globally, but if nations require local data centers, the cost of providing this service (and the price to consumers) will increase.

Excess Competition Reduces Innovation

Large markets enable firms to sell more. But if larger markets come with larger numbers of competitors, total sales per firm can remain the same or even fall. But isn’t this competition good for innovation? In fact, many studies have shown that innovation and competition can be modeled according to an inverted “U” relationship, with both too much and too little competition producing less innovation. One study of UK manufacturing firms found this relationship.¹⁷⁷ Others, including Scherer and Mukoyoma, have found similar patterns.¹⁷⁸ Similarly, in a study of U.S. manufacturing firms, Hashmi found that too much competition led to reduced innovation.¹⁷⁹ Firms need to be able to obtain Schumpeterian profits to reinvest back into innovation that is both expensive and uncertain. As Carl Shapiro notes, “Innovation incentives are low if ex-post competition is so intense that even successful innovators cannot earn profits sufficient to allow a reasonable risk-adjusted rate of return on their R&D cost.”¹⁸⁰

This does not mean that market-generated competition is detrimental. In fact, William Lewis, the former head of the McKinsey Global Institute, has argued that there is perhaps no factor more important to driving economic growth than the presence of competitive markets. As he writes, “Differences in competition in product markets are much more important [than differences in labor and capital markets]. Policies governing competition in product markets are as important as macroeconomic policies.”¹⁸¹ Normally, markets will not produce an excess number of competitors. But government action often does so, through discriminatory government procurement practices, financial bail-outs, or other

policies favoring weaker domestic innovation firms. These policies allow weak firms to remain in the market, drawing off sales from stronger firms and reducing their ability to reinvest in innovation.

For example, China has used LBT policies in the aviation industry. Designing and building jet airplanes—especially larger, multi-aisle airplanes—is incredibly expensive and risky and given this it is not surprising that there are just two major global competitors (Airbus and Boeing). But this has not deterred the Chinese government from attempting to artificially create a third competitor, COMAC (a state-owned Chinese commercial aircraft company) in part through LBTs. Indeed, COMAC benefits from a wide array of mercantilist policies, including forced technology transfer in exchange for market access and discriminatory procurement.¹⁸² If these unfair policies allow COMAC to become successful, the result will be reduced revenues for Airbus and Boeing to invest in next generation aviation innovation.

LBTs often raise the cost of critical capital goods, such as information and communications technologies, and this stunts innovation and productivity growth across all sectors of an economy, thereby compromising broader economic growth.

Weak IP Protections Compromise Innovation

LBTs pose a particular threat to innovation-based industries because they depend on intangible capital, much of it embodied in intellectual property. Yet strong intellectual property rights are vital for a robust life cycle of innovation because they increase the appropriability of the returns to innovation, enabling innovators to capture more of the benefits of their own activity. As they capture a larger portion of the benefits of their innovative activity, innovators again obtain the resources to pursue the next generation of innovative activities. However, if competitors are able to enter and/or remain in the market because they obtain an innovator's IP at less than the fair market price (either through coerced technology or intellectual property transfer as a condition of market access or outright IP theft), they are able to siphon off sales that would otherwise go to innovators. For example, if a government wants to improve the technology of its steel industry, it can't send in a platoon of soldiers to another nation to steal their advanced mills. But if it wants to expand its life sciences industry it might require foreign drug companies to license their IP to local companies in order to sell in the market (as India has).

As noted, a host of nations, including Brazil, China, and India (among many others), require forced technology transfer in exchange for market access. So when a country such as India issues a compulsory license of biopharmaceutical intellectual property that permits the local generic manufacture of a biopharmaceutical drug, this both compromises the original innovator's ability to earn a return on its investment in the Indian marketplace, and also risks handing the intellectual property to a competitor who can then manufacture the drug to compete on global markets—further threatening the innovator's ability to earn profits that can be reinvested back into the next generation of innovation. Preventing such actions through globally strong IP protections is essential if innovation is to flourish in the global economy.

Localization Barriers to Trade Can Damage the Countries That Use Them

Although LBTs appear as if they would benefit the countries that institute them, in reality, LBTs can actually harm these economies. First, LBTs tend to raise the cost of key capital

goods, such as information and communications technologies, which damages capital goods-using sectors and lowers innovation, productivity, and economic growth. Second, LBTs damage countries' participation in global value chains for the production of high-technology products. Third, LBTs are not economically efficient. Fourth, LBTs cause reputational harm to a country that damages its attractiveness as a location for foreign direct investment. Fifth, LBTs isolate countries from the global economy and tend not to achieve their intended effects in the manner countries desire. Finally, LBTs distract countries from the types of policies they really should be implementing and sectors they should be empowering to grow their economies.

Raising the Cost of Key Inputs, Including ICTs and Other Capital Goods

In the 1990s, Mexico's government, in the interest of trying to spur development of an indigenous computer manufacturing sector, imposed joint venture and domestic content requirements on leading computer manufacturers including Apple, Compaq, Hewlett-Packard (HP), and others. But by forcing the computer manufacturers to source components from domestic producers whose components were more expensive and of inferior quality, these requirements contributed to the computers coming off Mexican assembly lines to serve local markets being three to four years behind industry standards and selling for prices 150 to 300 percent higher than the world average.¹⁸³

This highlights a fundamental weakness in countries' use of localization barriers to trade: they often raise the cost of critical capital goods inputs, particularly for general purpose technologies (GPTs) such as information and communications technology, and this stunts innovation and productivity growth across all sectors of an economy, thereby compromising broader economic growth. LBTs also raise the price of key consumer goods, such as drugs, medical devices, and solar panels, limiting their use.

Capital investment in machinery, equipment, and software is a paramount driver of innovation and productivity. Without new capital investment refreshing a nation's capital stock, innovation loses its power, productivity growth stagnates, and business competitiveness declines. This is true in large part because it is through purchases of new equipment that innovation is diffused. Indeed, contrary to conventional wisdom, investment is not really about acquiring "more" equipment; it is about acquiring newer and more innovative equipment, acting as a sort of "refresh" rate for the economy, in that when an innovation occurs, it then diffuses throughout the economy through the replacement of older capital with the newer and more productive capital. Thus, a high rate of investment enables innovations to swiftly spread through an economy, bestowing their economic benefits upon users. And investment in some capital goods, such as ICTs, is even more important because they have even larger impacts on growth because they enable downstream innovations in products, processes, business models, and business organization.¹⁸⁴

This explains why ICTs have become the modern economy's greatest driver of economic growth, in developed and developing countries alike. For example, according to Japan's Ministry of Internal Affairs and Communications, Japan's ICT industry contributed 34

percent of the country's economic growth from 2005 to 2010.¹⁸⁵ Just the same, a December 2010 World Bank report, *Kenya Economic Update*, found that, "ICT has been the main driver of Kenya's economic growth over the last decade," with ICTs responsible for roughly one-quarter of Kenya's GDP growth during the 2000s.¹⁸⁶ As Manchester University's Richard Heeks concludes, "ICTs will have contributed something like one-quarter of GDP growth in many developing countries during the first decade of the 21st century."¹⁸⁷ And the reason why is that ICT continues to generate a bigger return to productivity growth than most other forms of capital investment.¹⁸⁸ Put simply, ICT is "super capital" that has a much larger impact on productivity than other forms of capital.¹⁸⁹

Moreover, a firm's investment in capital equipment—and particularly ICTs—is especially important because it produces spillovers that extend beyond the firm and benefit the broader economy. For example, Van Ark finds that the spillovers from investment in new capital equipment are larger than the size of the benefits accrued by the investing firm.¹⁹⁰ For ICTs, Hitt finds that the spillovers from firms' investments in information processing, equipment, and software (IPES) are "significant and almost as large in size as the effects of their own IPES investment."¹⁹¹ In other words, firms capture on average only about half the total societal benefits from their investments in IPES.

Yet, by definition, LBTs raise the price of—or compel the use of inferior—capital goods, including ICTs, and this hurts capital goods users, including not just large and small companies, but the growing share of "prosumers" (e.g., consumers who use ICT to assume part of the production function). But raising the price of, or limiting access to, best-of-breed capital goods and services only inhibits their adoption by both manufacturers and domestic-serving sectors of the economy—such as financial services, retail, transportation, education, and government—severely limiting productivity growth in these sectors.

For example, LBTs imposed by countries on digital services such as cloud computing provide a concrete example of how LBTs compromise the ability of ICTs to deliver productivity gains for economies. Cloud computing promises the potential to increase efficiency and reduce costs in the public and private sectors. But cloud computing services can only flourish if governments permit the free flow of data across borders. Restrictions on the cross-border flow of information diminish the ability of service providers to distribute data over a diverse geographic region to ensure redundancy and increase reliability, an important benefit of cloud computing. Localization requirements thus have the effect of making cloud computing less efficient, since data center siting decisions must be made based on political mandates rather than on technical or economic factors. In a like manner, local data center requirements imposed on firms providing digital services harm economic productivity and dramatically undercut the efficiencies made possible by cloud computing and networked technologies.

But it's not just that LBTs raise the cost of capital goods like ICTs for a country's product and services industries, thereby often forcing those industries to raise their prices (ironically causing their exports to be less competitive in global markets) and lowering their

Higher ICT costs engendered by countries' use of LBTs compromises the adoption and diffusion of ICTs that are key economic growth drivers.

productivity growth rates, it's also that the higher costs of ICTs compromise the ability of domestic firms to innovate. For example, the Organization for Economic Cooperation and Development (OECD) has found that the probability of innovation in a firm increases with the intensity of ICT use, and that this holds true for both manufacturing and services firms and for different types of innovation.¹⁹² Likewise, in the European Union, of the 32 percent of companies that report being "active innovators," ICT enables half of those firms' product innovations and 75 percent of their process innovations.¹⁹³

This even holds true for a country's manufacturing industries. Modern manufacturing processes increasingly rely on sophisticated ICTs, making ICTs a foundational building block for a country's manufacturing base. For example, a recent study by the IDA Science and Technology Policy Institute finds that modern manufacturers "rely less on labor-intensive mechanical processes and more on sophisticated information-technology-intensive processes."¹⁹⁴ Numerous examples of ICT hardware usage exist in the manufacturing domain, including in robotics and in the ICT hardware that supports digital-control systems, integrated sensing, and computer numerically controlled machines. But they are also seen in the provision of ICT services, including computer-aided design (CAD), modeling and simulation, big data analytics, and cloud computing. In fact, services now account for at least 30 percent of the inputs used by manufacturing industries.¹⁹⁵ This is why lowering barriers to trade in services decreases their import costs and thus raises the competitiveness of domestic manufacturing industries. And it's why when LBTs have the effect of raising the cost of the ICT hardware and services that are increasingly vital to modern manufacturing processes, it undermines competitiveness across all of a country's manufacturing industries.

India's experience with imposing high tariffs on ICT products as part of its import substitution industrialization policies in the 1970s provides a strong example of how higher costs for ICTs (whether a result of tariffs or LBTs) retards productivity growth in other sectors of the economy as well as overall economic growth. In the 1970s and '80s, India, like Mexico, erected barriers, including high tariffs, to the importation of computers and other ICT hardware with the intent of spurring development of a domestic computer industry. But economists Kaushik and Singh found that for every \$1 of tariffs India applied to imported computers, the country lost \$1.30 due to lost spillover effects, particularly the productivity losses that occurred in other sectors of the economy as they used relatively less ICT.¹⁹⁶ As the authors wrote, "High tariffs did not create a competitive domestic [hardware] industry, but [they] limited adoption [of ICT by users in India] by keeping prices high."¹⁹⁷ Thus, in the interest of favoring one industry—domestic ICT hardware manufacturers—India ended up harming all the other industries in its economy.

More broadly, higher ICT costs engendered by countries' use of LBTs compromises the adoption and diffusion of ICTs that are key economic growth drivers. Gurbaxani et al. find that for every 1 percent drop in price in ICT products, there is a 1.5 percent increase in demand.¹⁹⁸ This is a nice example of import demand elasticity—lower prices leading to increased demand for a product or service. That's why trade-barrier eliminating agreements like the Information Technology Agreement (ITA, which removes tariffs on trade in ICT

products and is currently being expanded to remove tariffs on hundreds of additional ones) have played such a profound role in reducing prices for ICT products and facilitating the diffusion of ICTs, such as mobile phones, throughout developing countries.¹⁹⁹ For instance, Indonesia went from having just 0.28 mobile phone subscribers per 100 citizens in 1996 to 98 in 2011. Likewise, in India, the number of cellular phone subscribers per 100 inhabitants increased from just 0.03 per 100 inhabitants in 1996 to 72 in 2011.²⁰⁰ To be sure, many factors contributed to the increased adoption of information technologies by businesses and consumers over these time frames, but their constantly decreasing costs were a key reason. But when LBTs raise the cost of ICTs, slowing the diffusion and adoption of ICTs, it's another way they undermine critical economic growth processes.

But these types of impacts are not only felt when countries' LBTs raise the cost of ICTs; they apply also when a country's LBTs raise costs on other capital goods which subsequently impose a larger cost on other producers in the rest of the economy.²⁰¹ This holds particularly true for capital goods that serve as intermediate inputs to finish products. For example, China's local content requirements on one capital goods industry, steel, have the effect of raising the cost of (or compelling the use of inferior) steel in other industries (such as automobile manufacturers) that rely on this vital intermediate input. The same effect would apply for countries imposing LBTs on machine tools—they only make all the other producers in an economy relying on these inputs less productive and competitive (in both domestic markets and foreign export markets).

Damaging Countries' Participation in Global Value Chains

Countries implement LBTs to benefit certain producers—often, as noted above, at the expense of their consumers. But the second reason LBTs can backfire is that they contravene the fact that the best way for countries to ensure their participation in global supply chains is by reducing barriers to trade and investment. More and more of the world's economic activity is now organized through global value chains and strategic networks, rather than through arm's length sales between vertically integrated buyers and sellers in different countries, as the textbook examples of international trade imply.²⁰² The most obvious evidence of this trend lies in the percentage of world trade made up of intermediate goods (goods sold to businesses, not consumers)—which now accounts for nearly a 60 percent share of world imports.²⁰³

But as the OECD's research into *Measuring Trade in Value Added* finds:

The growing fragmentation of production across borders has important policy implications. It highlights the need for countries wanting to reap the gains from value chain participation to have open, predictable and transparent trade and investment regimes as tariffs and other unnecessarily restrictive non-tariff measures impact foreign suppliers, international investors, and domestic producers.²⁰⁴

That's why the OECD has found that countries not participating in the Information Technology Agreement saw their participation in global ICT value chains decline by over 60 percent from 1995 (when the ITA was chartered) to 2009.²⁰⁵ And it explains why most

Countries that impose LBTs to spur domestic ICT production only end up excising themselves from the global value chains and production networks for ICT products.

ITA members have experienced faster growth in ICT services exports as a percentage of their overall services exports than non-ITA members, as Figure 4 illustrates. In fact, 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 2011) in China, Malaysia, and the Philippines, while ICT services exports as a percentage of the country's total services exports fell by 178 percent and 247 percent, respectively, in non-ITA member countries Chile and Brazil.²⁰⁶ The message is clear: countries that don't participate in open cross-border flows of ICT products, such as by imposing LBTs, only end up excising themselves from global value chains and production networks for ICT products.²⁰⁷

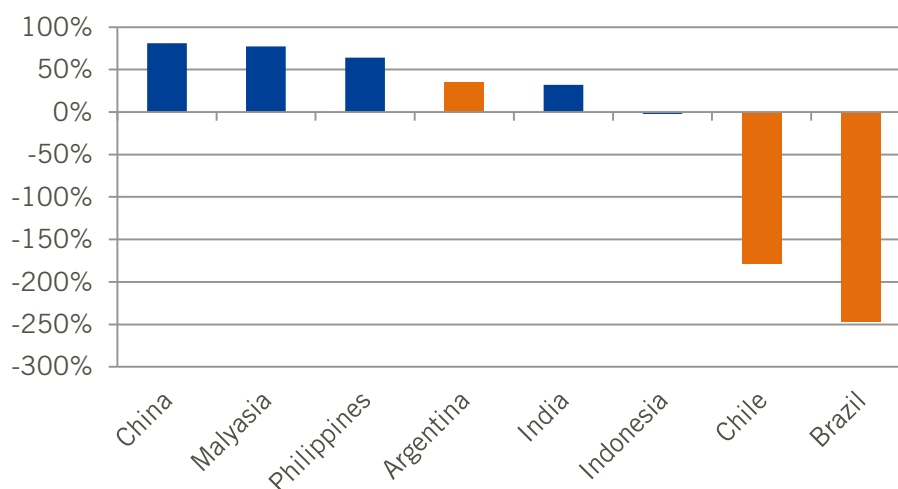


Figure 4: Percent Change in ICT Services Exports as Percentage of Total Services Exports, 1996 (or most recent year available) to 2011²⁰⁸

Moreover, the impact of global value chains extends well beyond trade in intermediary products. Global value chains draw “a broader range of establishments, firms, workers, and countries into increasingly complex and dynamic divisions of labor,” which has driven a much deeper and more far-reaching change in the organization of production globally and the basis of competition.²⁰⁹ To the extent that participation in global value chains represents the new gateway to global markets, enterprises “must find ways to participate, add value, and *specialize*.”²¹⁰ Thus, countries’ trade policies should be geared toward facilitating this process, and removing LBTs that distort it.²¹¹

Seen from this light, LBTs—even in the name of helping the least developed countries—are self-defeating.²¹² They undermine the ability of local firms to participate in a more networked global economy, both by raising their costs, and by foreclosing one of the main channels through which technology is diffused. A broader liberalization of trade barriers would have the opposite effect, if accompanied by parallel approaches to improve an economy’s ability to attract those factors of production critical to participating in a more networked global economy.

Inflicting Broad Economic Inefficiencies

LBTs tend to inflict broad economic inefficiencies upon the nations that field them. To be sure, LBTs can get some production established, but these polices are not free. While sometimes they cost governments more money directly (e.g., through discriminatory procurement), in many cases the costs are borne by consumers and other businesses, representing a hidden tax that policymakers can more easily impose than a direct surcharge. As political scientist Mancur Olsen explained in his book, *The Logic of Collective Action*, it is easier to pass bad policies when the costs are dispersed among a large group while the benefits are narrowly concentrated.²¹³ Most LBTs—especially those forcing the establishment of local production—hurt consumers, businesses, and/or taxpayers by raising the cost of products and services. For example, governments that perfunctorily favor domestic bidders over foreign ones in government procurement contracts hurt themselves and their own citizens if they have not thoroughly evaluated the merits of foreign bidders' products and services in a good-faith effort to select best-value bids. Governments can suffer by either receiving inferior technology, products, or services, or by paying more for them. For example, as part of the Brazilian government's "IT Maior" plan, companies selling IT software and related services to the public sector must be certified as to whether they are using "national technology." Brazilian agencies must pay a price premium to buy this "home-grown" technology. The government does the same thing with pharmaceutical products, paying up to 25 percent more for drugs that are made in Brazil, reducing drug coverage for the population. The result is that the government uses less IT than otherwise and that fewer pharmaceutical drugs are available for Brazilian residents.

This is why OECD data strongly suggest that increasing competition in government procurement practices can make big differences for economies.²¹⁴ As India's *Draft National Competition Policy* observes:

Public procurement of goods or services is a key economic activity of governments accounting for 20 to 30 percent of GDP in India...As per the findings of an OECD survey, savings to public treasuries between 17 percent and 43 percent have been achieved in some developing countries through implementation of competitive procurement processes. In view of the huge public expenditure on procurement including in infrastructural sector, substantial savings can be achieved in India by infusing greater competition, which in turn could release resources for the much needed investment in social sector development in the country.²¹⁵

Thus, when nations use price preferences or local content requirements in public procurement activity, they increase inefficiencies that harm economic growth.

Incidentally, the same effect happens when countries impose unfair standards-related measures, which ultimately harm local consumers and businesses. These costs can be significant. The OECD estimates that complying with economy-specific technical standards can add as much as 10 percent to the cost of an imported product.²¹⁶

LBTs damage countries' reputations as attractive locations for foreign direct investment and other enterprise activity.

Damaging National Reputations

Attracting foreign direct investment constitutes an increasingly important component of many countries' economic development strategies. But LBTs damage countries' reputations as attractive locations for foreign direct investment and other enterprise activity. The attitude among businesses becomes, "why would we want to invest in these countries unless we're forced to?" And as such they invest the bare minimum they have to.

Consider that, from 2002 to 2008, the BRIC economies of Brazil, China, India, and Russia accounted on average for 22 percent of global FDI projects, but this share declined to 17.6 percent in 2012.²¹⁷ These countries' loss of global FDI share suggests that their increased embrace of LBTs are making them less attractive to global investors.

This dynamic is quite apparent in India, where it's clear that the country's recent dalliance with forced localization policies have contributed to declines, rather than increases, in inbound foreign direct investment. For example, FDI into India's electronics and telecommunications sectors has fallen off a cliff, in part due to the government's announcement of its Preferential Market Access policy. Specifically, FDI into India's telecommunications sector fell from \$2 billion in the period from April 2011 to March 2012 to just \$70.6 million from April 2012 to December 2012. FDI into India's electronics sector fell by over 80 percent between those two time-frames.²¹⁸

Likewise, last fall, India partially loosened restrictions on foreign direct investment in its retail sector, allowing foreign companies to invest in Indian supermarkets for the first time, up to a maximum stake of 51 percent. But as *The New York Times* writes, India "expected a number of major retailers like Walmart and other companies to come rushing in. [But] the companies have instead stayed away, worried by the government's constant policy changes" and "lack of clarity on policies such as how much of a company's products would have to be sourced locally."²¹⁹ Reactions like these are why, across India's entire economy, FDI inflow fell by a total of 13.5 percent in 2012.²²⁰ As *The Economist* writes, in the end, "coercing Indians and foreigners to do business [is] self-defeating."²²¹

Put simply, LBTs damage the relationship between the management running multinational businesses and government officials in the countries that implement them. Ultimately, they undermine the investment climate, and cause global enterprises and their establishments to search for other countries in which to locate globally mobile investment activity.

Isolating Nations from the Global Economy

Success today—even for large nations like Brazil, China, and India—depends on growing establishments and enterprises that are global in reach. And this applies not just to innovation industries, but to all traded sectors. LBTs represent a poor policy instrument because in the long run they isolate nations from global markets instead of integrating them. As Georgetown University Professor Ted Moran finds in *Harnessing Foreign Direct Investment for Development*, "The historical experience of trying to build up the host country industrial base through imposing domestic content requirements on protected foreign investors...has turned out to be quite disappointing."²²² Moran's research finds that

The historical experience of trying to build up the host country industrial base through imposing domestic content requirements on protected foreign investor has turned out to be quite disappointing.

foreign-owned plants that are built to serve protected host country markets consistently fail to live up to their infant-industry or import substitution industrialization goal of creating internationally competitive operations. Rather, their operations are typically sub-scale and incorporate older technology and quality control mechanisms. Somewhat counter-intuitively, the performance requirements imposed on these investors—such as joint venture and domestic content requirements—result in fewer backward linkages and less technology transfer than their export-oriented FDI counterparts. As Moran concludes, “FDI projects oriented toward protected local markets detract from host country welfare and retard host country growth with stronger adverse effects than have previously been documented.”²²³

For example, Moran finds that “the record shows that ownership restrictions and other requirements for forced technology transfer have been met in China, as in other countries, with hesitancy on the part of foreign investors to expose their most advanced technologies and production procedures to operations over which they have limited control.” For example, in examining firms operating in mandated joint ventures in China, Moran finds that “only 23 percent of the fifty-fifty shared ownership firms and 6 percent of the majority indigenous Chinese-owned firms used technology as advanced as the parent firm.” Moran concludes that, despite its success in attracting FDI, “China has experienced exactly the same difficulties as other countries when host authorities require foreign firms to operate with a local partner with a goal of forcing technology transfer.”²²⁴

In contrast, Moran finds that foreign-owned plants that are built to penetrate international markets, often as part of the parent multinational’s own supply chain, operate with the most advanced technologies and embody the most sophisticated quality control procedures. They pay wages higher than their local counterparts do, and as the complexity of their operations increases, they seek to attract and keep skilled workers by offering superior working conditions. And they generate backward linkages to local firms if the host country business climate and worker training institutions are conducive to the emergence of suppliers.

For instance, once Mexico abandoned the mandatory joint ventures required by its domestic content informatics policy, it achieved results not unlike those previously seen in East Asian countries such as Malaysia, Singapore, and Thailand. Mexico’s decision to allow IBM to establish a wholly owned plant dedicated to exporting components and products into the parent’s Western Hemisphere sourcing network stimulated HP and Apple to follow in IBM’s footsteps, building new full-scale production sites for export as well as domestic sales. These moves saw the emergence of a “Little Silicon Valley” near Guadalajara, Mexico, as companies like 3Com, IBM, Intel, and HP started bringing their component suppliers, such as Flextronics and NatSteel Electronics, with them from Southeast Asia.

Ultimately, Moran finds that, “The positive contribution to host country growth and welfare from FDI projects that are incorporated into the multinational corporation’s international supply network is ten to twenty times more powerful than has conventionally

been estimated.”²²⁵ The message is clear: foreign direct investment works best in developing countries when multinational corporations are attracted to the investment environment and can freely integrate the operations of the establishment into the organization’s international supply network.

India’s experience with imposing local content requirements on solar cell production provides another strong example of how LBTs can ironically isolate a country from the global economy. In fact, even India’s own largest manufacturer of photovoltaic solar cells, Welspun Energy Ltd., has argued that forcing projects to buy local equipment moves India’s solar industry away from the global technology frontier, and in the process raises costs while compromising quality. As Welspun Energy Managing Director Vineet Mittal warned, “Not a single Indian manufacturer can provide insurance for their modules for the 25-year lifetime of projects.”²²⁶ That means banks won’t finance projects that use such equipment because locally made cells don’t convert sunlight into electricity as well as foreign-made models.²²⁷ In pressing India to drop the probe, representatives from China Sunergy argued that, “The inability of the domestic industry to keep up with the technological developments of the global industry has limited its ability to compete with international manufacturers and is a major cause for injury.”²²⁸

At the end of the day, countries’ use of LBTs effectively represents a modernized version of the failed import substitution industrialization (ISI) policies of the 1960s and 1970s. And, as Box 2 shows, such policies are no more effective today than they were then. Such import substitution industrialization policies failed because they depended on markets that were too small or too poor to provide economies of scale, and on demand conditions that were too isolated to produce globally competitive industries.²²⁹ As Albert Hirschman wrote about the experiences of Latin American countries using ISI policies in the 1960s and 1970s, “the blame for the economic disasters in these countries lay not in the use of policies considered by economic theorists to be wrong, but in the blind pursuit of policies considered by theorists to be right.”²³⁰ In other words, ISI policies, like LBTs, may appear capable of generating short-term gains for economies, but ultimately they don’t fundamentally raise the competitive capacity of an economy, and so don’t produce the intended effect.

Distracting from Policies That Should be Implemented

The final way forced localization policies damage the countries that implement them is that they represent a shortcut to growth through which countries try to attract foreign investment without having to make the tough policy reforms required to make their economies genuinely competitive. Instead of creating the prerequisites of a vibrant economy—strong infrastructure, education, scientific research, and a good business and regulatory environment, etc.—LBTs attempt to force economic activity to their shores. But this gives governments an out from doing the hard work of addressing real economic challenges. For example, India is one of the weakest investors in R&D among developed countries and has one of the lowest numbers of researchers per capita among major developed countries; with only 120 researchers for every million people, it has a rate 1/5th

Countries that outperform their peers on productivity do not have a more “favorable” sector mix (e.g., more high-tech industries), but instead have more productive firms overall, regardless of sector.

China’s and 1/25th Korea’s.²³³ It has an infrastructure investment deficit running into the hundreds of billions of dollars, as evidenced by recurring rolling power blackouts, inadequate ports, and limited road connections. This hurts manufacturing, which requires state-of-the-art infrastructure and access to reliable power and water. If countries like India wish to attract FDI, successfully addressing these challenges is the way to do so, not by issuing rules that force local production.

The following section describes in detail the productivity- and innovation-based economic policies countries should be implementing.

PRODUCTIVITY AND INNOVATION-BASED ECONOMIC DEVELOPMENT

As discussed previously, LBTs are often counterproductive for countries, especially over the medium and longer term. Moreover, countries can achieve faster and more sustainable economic growth by enacting a range of pro-innovation economic development policies that not only support the competitiveness of private sector enterprises but that also—and more importantly—seek to boost productivity growth across-the-board in all industries, traded and non-traded alike.

Increasing Across-the-Board Productivity Growth

Productivity growth—the increase in the amount of output produced by workers per a given unit of effort—is the most important measure and determinant of economic performance for any nation.²³⁴ For instance, if U.S. productivity were to grow just 1 percent faster for the next 40 years than it did during the 1980s, the average American would earn \$41,000 more per year than he or she would otherwise.²³⁵

Economies can increase their productivity in two ways: either through the “growth effect” or the “shift effect.” In the first, all sectors of an economy become more productive. For example, a country’s retail, banking, transportation, and automobile manufacturing sectors might all increase their productivity at the same time. This can happen as a result of firms investing in new technologies or improving workers’ skills, or by higher productivity firms gaining market share from lower productivity firms within an industry (e.g., Wal-Mart gaining customers that used to shop at mom and pop stores). The second method, the shift effect, occurs when low-productivity industries lose share to high-productivity industries (e.g., a country’s semiconductor industry grows while its textile industry shrinks).

But which productivity strategy—across-the-board growth or the shift effect—is the best path to higher productivity and per capita incomes? The answer depends in large part on the size of the economy. The larger the economy, the more important the growth effect is, while the smaller the economy, the more important the shift effect is. To understand why, consider an automobile factory in a small city. If its managers install a new computer-aided manufacturing system and raise the plant’s productivity (the growth effect) a large share of the benefits will flow to the firm’s customers around the nation and even around the world in the form of lower prices. The city will benefit only to the extent that its residents buy cars from that factory or if some of the increases in productivity go to higher wages instead of only to lower prices.²³⁶ In contrast, if the city attracts another auto plant to replace a

textile firm (where value added per worker is less) that moved overseas to a low-wage nation (the shift effect), most of the benefits will accrue to residents in the form of higher wages for the workers who moved from the textile plant to the car factory (and from more spending at local-serving businesses like restaurants, dry cleaners, furniture stores, etc.). This means that across-the-board productivity growth, rather than a shift to higher-value-added sectors, will be more important for larger economies, because their consumers will capture a greater share of the productivity gains. Yet, even for small economies, across-the-board productivity gains are still a vitally important way to become richer, especially through productivity gains in domestic-serving industries where all the benefits (whether to local consumers or local workers) benefit the economy.²³⁷

Put simply, the lion's share of productivity growth for almost all nations comes not from changing the sectoral mix to higher-productivity industries, but from all industries and organizations, even low-productivity ones, boosting their productivity. Overall, the evidence shows that it is changes in organizations (e.g., businesses, government, non-profits, etc.) that drive productivity growth, with about 80 percent of productivity growth coming from organizations improving their own productivity and only about 20 percent coming from more productive industries replacing less productive ones. In other words, the productivity and innovation capacity of a country's sectors matters more than its mix of sectors, suggesting that across-the-board productivity growth is the optimal way for countries, developed and developing alike, to grow. And this is exactly what the McKinsey Global Institute's 2010 report, *How to Compete and Grow: A Sector Guide to Policy*, finds. Countries that outperform their peers on productivity do not have a more "favorable" sector mix (e.g., more high-tech industries), but instead have more productive firms overall, regardless of sector.²³⁸ As the report elaborates:

Some observers believe that countries can outperform their peers because they have a mix of sectors that have a more favorable growth momentum. But the mix of sectors does not explain differences in the growth performance of countries with similar levels of income at all. The mix of sectors is surprisingly similar across countries at broadly equivalent stages of economic development. It is not the mix of sectors that decides the growth in developed economies, but rather the actual performance within the sectors compared with their counterparts in peer

economies... This demonstrates the fact that, even if they started with a less favorable sector mix, the fastest-growing countries outperformed their peers in terms of their sector competitiveness.²³⁹

But to the extent that countries—and global economic development agencies, as page 54 explains—have cared about raising productivity, virtually all have focused on trying to attract or grow firms in higher-wage industries. And all too often this focus on high-wage industries over across-the-board productivity growth leads them to implement mercantilist innovation policies such as localization barriers to trade. But this is neither effective nor sustainable. Neither the United States nor Europe can indefinitely serve as import engines for countries making exports their primary path to economic growth.

There is a long tradition in the international development field of focusing more on growth from the shift effect than from the growth effect.

Worse, because real productivity growth comes from all industries boosting productivity, and since LBTs limit economies' access to productivity-enhancing technologies, these countries miss out on the most significant economic growth opportunities. This outcome is evident in nations that have followed the "shift" rather than across-the-board productivity growth strategy: they may grow quickly for a while, but they end up in a "growth cul-de-sac" because high-wage export sectors can only take an economy so far. For example, despite some extremely productive and innovative multinational firms, overall Japanese productivity is just 70 percent of U.S. rates, while South Korea's productivity is just 50 percent of U.S. rates.

The gap is even greater in developing nations following the shift strategy. For example, overall productivity in India is but 8 percent of U.S. rates, while Chinese productivity is just 14 percent of U.S. rates.²⁴⁰ A central goal of the Chinese government's economic development strategy is to promote seven Strategic and Emerging Industries—ICT, clean energy, materials science, nuclear fusion and nuclear-waste management, stem cells and regenerative medicine, public health, and the environment—and to have these industries contribute 15 percent of overall value-added to China's GDP by 2020. But even if China is successful in its mercantilist-enabled shift strategy to promote these seven Strategic and Emerging Industries—spending the equivalent of \$1.5 trillion to do so—it will have only gained the equivalent of 14 months of productivity growth (assuming a continuation of past overall Chinese economic and productivity growth trends).²⁴¹ In other words, China will invest a lot of money and effort for very little payoff. Likewise, while India is turning to LBTs to gain some manufacturing, it could raise Indian living standards by over 10 percent if it could raise productivity in its retail and banking sectors to just 30 percent of U.S. levels. In fact, the McKinsey Global Institute finds that productivity gains will contribute more to growth than new employment across most Indian economic sectors from 2010 to 2020.²⁴² Thus, attracting more high-value-added export firms is not likely to be the major path to growth for countries in the long-run, but boosting productivity in the vast non-traded swaths of countries' economies is.²⁴³

If employing localization barriers to trade, indigenous innovation policies, or general mercantilist strategies is not the path to sustainable economic growth, what is? The answer is "innovation economics," which holds that the path to higher incomes lies in raising productivity by boosting innovation across all firms in all sectors.²⁴⁴ Some nations have realized that this is a superior path. For example, in its *Agenda of Innovation and Competition 2010-2020*, the Chilean National Innovation Council on Competitiveness states that, "The decline in the rate of productivity growth (TFP) is the main factor that reduces potential growth: this accounts for an inability of the Chilean economy to generate innovation, production diversification, and sophistication."²⁴⁵ The report adds that, "The challenge is to increase the productivity of companies and export diversification through innovation of process, management, products, and business models."²⁴⁶ The Council lists several policies Chile can implement to achieve these goals, including: developing human capital at all levels, generating basic science capabilities with a strategic orientation, strengthening the development of knowledge and critical thinking in universities, bringing

businesses to the technological frontier, and consolidating the institutional framework for innovation.

Perhaps the best way to think about the policies needed to effectively grow an economy is to envision a four-stage pyramid, as depicted in Figure 5 (see page 58). At the base level are key framework conditions: factors such as the rule of law; effective government; a culture of trust; effective protection of property, including intellectual property; and adequately competitive markets, including openness to trade and foreign direct investment. Without these key framework conditions, even the best and most sophisticated innovation policies will not succeed. The next level above these basic framework conditions includes an effective tax, trade, and regulatory environment, including both social (e.g., environmental) and economic (e.g., industry) regulations. Key factors here are not just predictability and ease, but also levels. Tax rates that are too high or regulations that are too onerous can stifle growth. The next level above comprises key factor inputs: the kinds of things firms need in order to succeed. These include robust physical and digital infrastructures; a skilled workforce with broad-based general capabilities but also the specialized skills matching the needs of key industries; and investment in knowledge creation (e.g., science and technology). But even these are not enough for success. Indeed, with more nations realizing that mastery of these three levels is what is needed just to “be in the game,” success requires going beyond this, to a fourth level, that includes effectively crafted innovation and productivity policies that are specifically tailored with regard to a country’s competitive strengths and weaknesses. Policies in this category include provisions such as R&D tax credits, support for regional innovation clusters, specialized R&D institutes, and ICT policies to support e-health, e-government, etc.

The rationale behind these policies is explained in detail on page 58, however, before beginning that, it is necessary to first understand what is wrong with the traditional economic development methodology.

Transforming Development Economics from a “Shift” to a “Growth” Strategy

Global economic aid, development, and trade organizations should have one overarching goal: to encourage all nations to focus on a strategy of growth, not shift. In other words, to

make boosting across-the-board productivity their top economic priority rather than changing their sectoral share from one of low-productivity industries to high-productivity industries.²⁴⁷

Yet, there is a long tradition in the international development field of focusing more on growth from the shift effect than from the growth effect. As Paul Krugman writes in *The Fall and Rise of Development Economics*, there is a long history of the emphasis on the shift strategy.²⁴⁸ Krugman cites a seminal 1943 paper by Rosenstein Rodan that argued for investment in manufacturing, discussing how “unemployed workers...are taken from the land and put into a large new shoe factory.”²⁴⁹ In the late 1950s, Albert O. Hirschman’s *The Strategy of Economic Development* articulated the theory of forward and backward linkages which was largely premised on the notion of large scale capital formation in select

manufacturing industries that then provided linkages, as nations evolved from agriculture.²⁵⁰ In the 1960s, Walt Rostow's *Stages of Growth* argued that countries must grow first through agriculture, then manufacturing, and finally services. Essentially, Rostow asserted that countries go through each of these stages fairly linearly, where stage one reflects a primary society of agriculture, stage two represents an industrial revolution, stage three represents a manufacturing economy, stage four represents a diversification toward a consumer goods economy, and stage five represents an economy with high disposable income.²⁵¹

This deep bias toward the shift strategy of development continues to be reflected in today's scholarly development literature. For example, Enrique Casares argues in *Productivity, Structural Change in Employment and Economic Growth* that sector-specific productivity changes in the manufacturing sector can increase the aggregate growth rate of an economy, but when sector-specific productivity changes occur in the non-manufacturing sector, the aggregate growth rate of an economy remains the same. In other words, all structural changes are dependent on the manufacturing sector because it is this sector that is responsible for transferring knowledge to other sectors.²⁵² According to Kukti Dasgupta and Ajit Singh in *Manufacturing, services and premature deindustrialization in developing countries: A Kaldorian analysis*, the rate of productivity growth depends on the expansion of the manufacturing sector. Expansion of the manufacturing sector will lead to more productivity growth from the manufacturing sector, which will lead to more productivity across the whole economy. This rate of productivity growth also depends on the release of labor from agriculture and non-manufacturing sectors to productive sectors such as manufacturing, thereby (according to Dasgupta and Singh), "Increasing productivity by releasing surplus labor from the non-dynamic sectors, and also by the expansion of the dynamic sectors."²⁵³

But some scholars go even further and actually argue against strong across-the-board productivity growth, claiming that it does not support employment growth. For example, in *Deindustrialization and the Social and Economic Sustainability Nexus in Developing Countries: Cross-Country Evidence on Productivity and Employment*, Ute Pieper contends, "The most compelling economic and social reason for the developing world to continue to industrialize is the enormous problem of global unemployment."²⁵⁴ Boulhol and Turner argue in *Employment-Productivity Trade-Off and Labour Composition* that labor market reforms that increase OECD labor utilization of low-productivity workers (putting more working people to work in low-productivity jobs) increases GDP per capita, but less than proportionally—only two-thirds of the employment gains affect GDP.²⁵⁵

Perhaps the most vocal opponent of the across-the-board productivity strategy, and someone whose influence persists to this day, is E.F. Schumacher, the author of the best-selling book *Small is Beautiful: Economics as if People Mattered*. He famously states, "While no one would suggest that output-per man is unimportant, the primary consideration cannot be to maximize output per man, it must be to maximize work opportunities for the unemployed and underemployed."²⁵⁶ He also adds, "The task in every case is to find an intermediate technology (which will be labor-intensive and will lend itself to use in small-

scale establishments) which obtains to a fair level of productivity without having to resort to the purchase of expensive or sophisticated equipment.”²⁵⁷ Schumacher’s argument calls for creating more jobs with outdated equipment, instead of boosting productivity through technology.

It would be one thing if the bias toward the shift strategy were confined to the academy, but it appears to be embedded in many if not all global development organizations, which in many cases actively encourage nations to shift their industrial mixes toward higher-value-added sectors, often through explicit export support policies. After this there is a steep and slippery slope to mercantilist policies such as localization barriers to trade designed to reduce imports and increase exports.

For example, in its effort to help lower-income countries (even ones that need no help, such as China) grow, the World Bank does not adequately differentiate between legitimate policies and mercantilist policies, such as localization barriers to trade. Moreover, all too often World Bank country policies are designed to not only promote the shift to higher-value-added industries, but also to do so through export expansion. For instance, in February 2012, the World Bank issued a report called *China 2030* which aimed to help the country find new growth drivers. It noted that “new technological opportunities make green development not just a realistic possibility but a potential driver of economic growth. If successful, green development will create new business opportunities, stimulate innovations in technology, and potentially make China globally competitive in sunrise industries.”²⁵⁸

The Bank provided the Chinese Export-Import Bank (Eximbank) funding in 2006 to “formulate a medium-and-long-term development strategy...including the strategic guiding ideology, the choosing of the medium-and-long-term development strategy together with feasibility analysis, the guidelines, policies, and measures for the implementation of the strategic goals.”²⁵⁹ The project funded experts to consult with the Bank as well as the travel of Chinese Eximbank officials overseas to study best practices, “such as export credit, trade financing, ship financing, and ODA [overseas development assistance] loan financing for small and medium sized enterprises.”²⁶⁰ Keep in mind that the main purpose of the Chinese Export-Import Bank is to fund Chinese companies so they can export, including to the United States. And they have been doing so with gusto. The Bank reports: “With China Eximbank credit support, China First Heavy Industries has seen enhanced market competitiveness and facilitated its exports of complete sets of large equipment...to regions worldwide.” It also provided the Aviation Industry Corporation of China with \$15 billion to help China’s aviation industry “achieve leaps and bounds development and seek further integration into the international aviation industry.”²⁶¹

By doing this the Bank reduces its focus on boosting innovation and productivity in the domestic-serving parts of these countries’ economies. In fact, the World Bank’s *2013 Jobs Report* argues for the acceleration of the reallocation of workers from areas and activities with low productivity to those with greater potential.²⁶² And, contrary to conventional economic wisdom, the World Bank often argues for the protection of jobs when there is a

possibility they could be replaced by productivity-enhancing technologies or processes. When jobs may be lost or threatened, and few are being created, the productivity of a protected job can still be higher than that of the alternative jobs the displaced worker may find. And the productivity gap may exceed the costs of keeping that job alive.²⁶³

But the World Bank is not alone in its short-term focus on export-led, “shift-based” development strategies. Most if not all of the other multilateral development organizations pursue the same focus, in part because most country and sector “desks” focus first and foremost on making loans or grants (after all, they see this as their primary mission). To the extent that they focus on results, it is on whether the particular country their desk serves does well, regardless of the effects of the strategy on the rest of world.

As such, there are three major problems with the economic development policies being championed by organizations such as the World Bank, regional development banks, and other organizations. First, by focusing on an export-led shift strategy, these organizations are engaging in a zero-sum global growth strategy, whereby the particular nation receiving development assistance might grow, but often at the expense of other nations. Second, by encouraging nations to adopt an export-based shift strategy, these organizations are not encouraging countries to adopt a more effective domestic productivity-increasing growth strategy. In fact, they are leading countries to believe that more exports and fewer imports, rather than across-the-board productivity, is the better path to growth. Finally, by giving absolutely no attention to the extent and egregiousness of their aid recipients’ mercantilism, these organizations are sending a clear message to countries: engage in mercantilist practices and the global community will not only fail to punish you, it will continue to reward you with grants and loans.

Occasionally, some reports (or statements in reports) from organizations such as the World Bank do get it right. For example, the World Bank’s *2013 Jobs Report* does note that the productivity gains from services liberalization could be substantial. The report notes, “Electricity, finance, telecommunications, and trade have a direct impact on production and transaction costs.” But it then couches these benefits by tying them to the export competitiveness of manufacturing by saying that these lower costs make “downstream sectors more competitive.”²⁶⁴ The Bank also states earlier in the report, “Conversely, measured output does not decline when jobs in export sectors are replaced by jobs producing for the domestic market...”²⁶⁵ So if the Bank appears to understand that across-the-board productivity growth is more effective, why isn’t this the dominant logic of the Bank’s economic development policies? Why does the World Bank host events such as *Making Growth Happen: Implementing Policies for Competitive Industries* instead of hosting ones titled *Making Growth Happen: Maximizing Productivity Growth Across All of a Nation’s Industries*?²⁶⁶

This all suggests that it’s time to significantly revamp the mission of existing international bodies, not only to better support sustainable global innovation but also to fight against innovation mercantilism. This means stronger enforcement by global bodies like the WTO against beggar-thy-neighbor mercantilist strategies. It means organizations like the World

Bank and the IMF, along with regional and national development organizations including the U.S. Agency for International Development, the Inter-American Development Bank, and the European Development Bank, no longer promoting export-led growth as a key solution to development. Such institutions need to begin tying their assistance to steps taken by developing nations to move away from negative-sum mercantilist policies, even if that means there is less demand for their aid and that the organizations themselves must downsize. Better to downsize than for these organizations to continue to be a key enabler of innovation mercantilist practices such as LBTs.

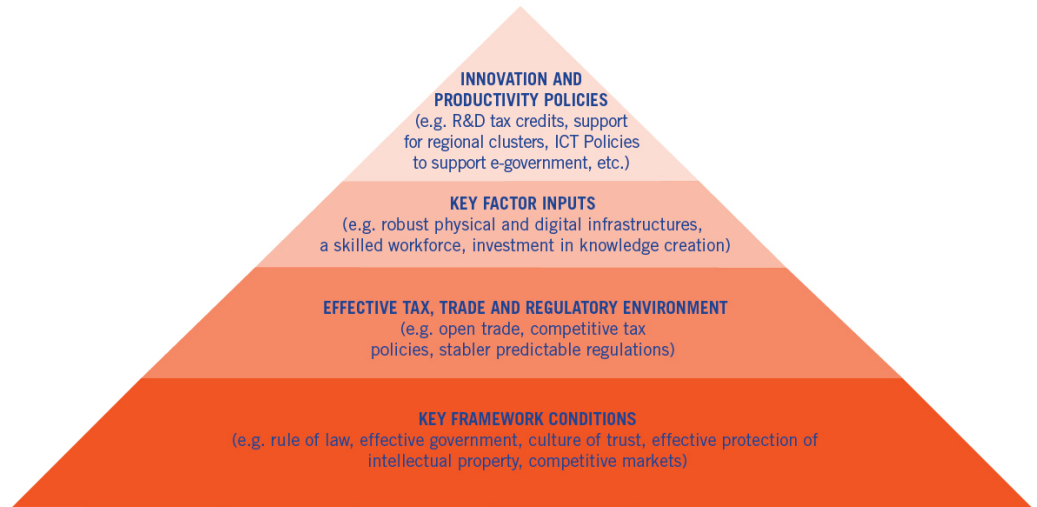


Figure 5: The Economic Growth Pyramid

The following section lists the kinds of policies countries need to implement in order to achieve across-the-board productivity growth and innovation.

Key Framework Conditions

Establishing strong framework conditions—particularly those ensuring the rule of law, securing robust intellectual property protections, and promoting domestic market competition—is essential if competitive markets are to flourish in countries, thus enabling private-sector innovation and productivity growth to thrive.

Rule of Law

From enforcing contracts to operating in a corruption-free regulatory environment, public sector regulations on private enterprise constitute “the rules of the road” for firms, impacting several stages in the lifecycle of a business. Countries that make these processes easier can foster domestic market competition and spur new firm growth.

For example, several leading countries have introduced a number of reforms to make the process of enforcing contracts smoother.²⁶⁷ New Zealand created new district court rules that streamline the process for enforcing contracts.²⁶⁸ The civil justice system in Hong Kong enacted reforms in 2010 aimed at increasing the efficiency and cost-effectiveness of settling commercial disputes. Yet contract enforcement processes are particularly time

consuming in many countries, such as in Italy, Slovenia, and India, where it takes 1,210 days, 1,290 days, and 1,420 days, respectively, to enforce contracts.²⁶⁹ Likewise, the cost to enforce a contract—defined as a percentage of the claim—is prohibitive in many countries, such as in Indonesia, where the cost to enforce a contract often exceeds the value of the claim.²⁷⁰

In addition, the extent of corruption in an economy significantly affects the business environment. Corruption includes both bribes paid to local bureaucrats for services or favors as well as the misuse of political power by government officials to interfere with economic decisions. Transparency International's *2012 Corruption Perceptions Index* measures 176 countries according to the perception of corruption in the private sector, scoring them on a scale from one hundred (highly clean) to zero (highly corrupt). As the report concludes, if corruption in the global economy is to be curbed governments worldwide need to integrate anti-corruption actions into all aspects of decision-making; prioritize better rules on lobbying and political financing; make public spending and contracting more transparent; and make public bodies more accountable.²⁷¹

Strong intellectual property rights protections are vitally important for developed and developing countries alike.

Robust Intellectual Property Rights Protection

Clearly delineated intellectual property rights are a *sine qua non* for an innovative economy. Effective protection and enforcement of IPR encourages innovators to invest in research, development, and commercialization of technologies while promoting their dissemination. But weak intellectual property rights protections reduce the flow of foreign direct investment and technology transfer. Without adequate intellectual property protections, there will be less innovation overall.

The evidence shows that strong intellectual property rights protections are vitally important for developed and developing countries alike. As a definitive 2010 OECD review of the effects of intellectual property rights protections on developing countries finds, “the results point to a tendency for IPR reform to deliver positive economic results.”²⁷² The study found that developing-country IPR reforms concerning patent protection have tended to deliver the most substantial results, but the results for copyright reform and trademark reform also are positive and significant. But to have the greatest impact on economic growth, IPR reforms must occur concomitantly with other positive complements, particularly those relating to inputs for innovative and productive processes and the ability to conduct business. These include policies that influence the macro-environment for firms, as well as the availability of resources (for example, those related to education), legal and institutional conditions, and fiscal incentives.²⁷³

Domestic Market Competition

As William Lewis, the former head of the McKinsey Global Institute, has argued perhaps there is no factor more important to driving economic growth than the presence of competitive markets. As Lewis contends, “Differences in competition in product markets are much more important [than differences in labor and capital markets]. Policies governing competition in product markets are as important as macroeconomic policies.”²⁷⁴ Countries that support competitive domestic markets create the conditions for new

entrepreneurial ventures to flourish while at the same time incentivizing established firms to continue to innovate and to boost productivity.

But countries that protect entrenched, incumbent, or politically favored industries from robust competition only damage their own countries' productivity and economic growth potential. For example, Argentina's grocery retail sector is one of the only ones in the world to have experienced large declines in productivity growth over the past two decades, primarily because its large, productive firms have lost market share due to extreme regulatory restrictions placed on them.²⁷⁵ In this case, rather than creative destruction leading to the exit of less productive firms, discriminatory policies against efficient (larger) firms coupled with the lack of enforcement of regulations on smaller and informal firms has meant that less efficient firms actually gained market share. For example, it can take four years to obtain a permit for a large grocery store, and regulations limit the size of stores and the maximum number of stores any one firm can operate in an area. Furthermore, the government imposes price controls on food, but only in larger stores, and the government limits imports of certain items by larger stores.

Of course, Argentina is not alone in terms of enacting policies favoring incumbents. To protect small booksellers from larger and/or online booksellers who can sell at a discount, France prohibits bookstores from giving discounts of more than 5 percent.²⁷⁶ Germany and Norway go even further, allowing no discounts. In Japan, laws limiting the entry of large supermarkets and providing incentives for small retailers to stay in business explain the country's high share of family retailers, and their low productivity. And, as noted, India has also long precluded competition in its retail sector by keeping foreign competitors such as Walmart out of its markets. For competitive domestic markets to thrive, governments must resist vested interests that can organize to limit innovation.

Another way to spur competition is to reduce or eliminate government-supported or government-enabled monopolies. These limit the incentives domestic producers have to become more efficient and innovative while at the same time hurting foreign producers. For example, the European Union appears to be favoring two European suppliers of enriched nuclear fuel and while it imposes strict limits on imports of nuclear fuel from the United States.²⁷⁷ In China, a monopoly created by the People's Bank has been allowed to operate electronic payment systems for Chinese currency credit cards, cutting leading foreign companies out of the sector. For competitive domestic markets to thrive in economies, governments must curb the role of state-owned enterprises and promote more competition across all sectors, including higher education, health care, transportation, utilities, and even the provision of government services itself.

Effective Tax, Trade, and Regulatory Environment

Regulations, taxes, and trade are crucial to the proper functioning of market economies. In particular, flexible regulations, including incentive-based regulations and performance standards, tend to aid innovation by maximizing the implementation leeway available to firms, allowing the market to dictate cost-efficient and commercially viable solutions. Moreover, nations compete based on the attractiveness of their tax environments, just as

As competition for internationally mobile investment has increased over the last quarter-century, most nations have established more competitive corporate tax codes.

they do based on the attractiveness of their talent or infrastructure base. Regarding embracing open trade, empirical data suggests that free trade benefits developed and developing countries alike. A World Bank study of 77 developing countries over a period of 20 years finds that a developing country's productivity is larger the more open it is to trade with industrial countries and the greater its foreign R&D investment.²⁷⁸

Thus, many countries have come to recognize that effective policies in these areas are indispensable tools in building global competitiveness. For example, one of the most effective tests of a regulatory environment is how difficult it is to start a business. Fortunately, a number of countries have made progress in streamlining the amount of time and expense it takes to do so. For example, Taiwan has reduced the time it takes enterprises to check company names, to register retirement plans, and to apply for health insurance. Countries such as Portugal that have streamlined and quickened their new business registration procedures have seen dramatic results. For example, Portugal's "On the Spot Firm" initiative enables new businesses to register with the government online in just 45 minutes, and has been so successful that 60,000 new firms have formed using this method in just two years.²⁷⁹

International tax competition is here to stay.²⁸⁰ As competition for internationally mobile investment has increased over the last quarter-century, most nations have established more competitive corporate tax codes.²⁸¹ For example, Deveraux, Lockwood, and Redoano find that corporate tax rates for OECD nations have declined from nearly 50 percent in the early 1980s to less than 35 percent in 2001, and that international tax competition was the principle driver of those reductions.²⁸² The message is clear: nations need competitive corporate tax systems in a global economy. Countries can no longer unilaterally design their own tax codes oblivious to the best practices other nations are implementing to make their economics as attractive as possible to business activity. But, as ITIF writes in *Effective Tax Reform for the Global Economy*, designed correctly, countries' tax codes can and should be a driver of competitiveness, productivity, and innovation.²⁸³

One technique many countries have taken to reduce corporate income taxes is to replace these revenues with value-added taxes (VATs).²⁸⁴ In 1989, 48 countries, primarily located in Western Europe and Latin America, had adopted a VAT. By 2007, 143 countries had VATs.²⁸⁵ One advantage of adopting a VAT is that it is border adjustable, meaning that exports are not taxed whereas imports are, thus improving U.S. competitive advantage.

Further, many nations have introduced or expanded corporate tax incentives for investment in modernized capital equipment. For example, companies in Malaysia can depreciate general plant and equipment over six years, heavy machinery over four years, and computer and ICT equipment even faster.²⁸⁶ In Singapore, firms can expense in the first year all computers and prescribed automation equipment, robots, and energy efficiency equipment. In addition, companies in manufacturing and engineering services industries may receive investment allowances for projects in addition to depreciation allowances.²⁸⁷ In Japan, companies can benefit from a modestly accelerated depreciation scheme (consisting of "increased initial depreciation" and "accelerated depreciation").²⁸⁸ In

Exposing domestic firms to international markets and forcing them to compete against sophisticated global competitors makes trade a strong driver of innovation and productivity growth.

the United Kingdom, firms can expense investments for plant and machinery up to £100,000 (\$156,000) in the first year. Singapore allows firms to expense in the first year all computer and prescribed automation equipment, robots, and energy efficiency equipment.²⁸⁹ In Canada, purchases of computers are eligible for a 55 percent declining-balance capital cost allocation rate in the first year. Manufacturing equipment is also eligible for accelerated depreciation.²⁹⁰ It should be noted that all of the incentives described here are not targeted at particular firms, but rather are open to all firms in all industries that make growth- and innovation-inducing investments.

Finally, with regard to trade, exposing domestic firms to international markets and forcing them to compete against sophisticated global competitors makes trade a strong driver of innovation and productivity growth. In fact, data from the OECD Innovation Microdata Project shows that exposure to international markets has a strong positive effect on either firms' incentives to innovate or on their ability to innovate.²⁹¹ In part, this occurs because international trade and investment allow for a freer flow of technologies across borders, enhancing competitive pressures and opening new markets. Indeed, a number of studies find that firms that are involved in trade and investment are more productive and innovative than purely domestic firms.²⁹² Thus, there is a two-way link between trade and innovation. On the one hand, innovation creates technological advantage, which together with differences in factor endowments is the source of comparative advantage, which in turn drives trade. Indeed, technology gaps have been found to be a key determinant of trade and investment between countries.²⁹³ In other words, countries shouldn't specialize in all technologies; trade enables them to specialize in what they are good at and trade for the rest. Moreover, open markets benefit innovative firms, leading to an increase in the size of the market over which the firm can leverage its innovation (through economies of scale). This is especially important for industries with relatively low marginal costs of production and high fixed costs (for example, semiconductors, software, movies and music, etc.), since larger markets can be served with overall declining average costs. On the other hand, trade and investment also spur innovation through competition effects, technology transfer, and spillover effects (including learning from exporting and learning by investing).

Supporting Investment in Key Factor Inputs

Governments also need to support investment in certain key inputs—particularly physical and digital infrastructure, education, and science and engineering—which constitute foundational building blocks that enable productivity and innovation to flourish across all sectors of an economy.

Investing in Physical Infrastructure

Extensive and efficient infrastructure is critical for ensuring the effective functioning of an economy, as it is an important factor in determining the location of economic activity and the kinds of activities or sectors that can develop in a particular instance.²⁹⁴ Well-developed infrastructure reduces the effect of distance between regions, integrating the national

market and connecting it at low cost to markets in other countries and regions. In addition, the quality and extensiveness of infrastructure networks significantly impact economic growth and reduce income inequalities and poverty in a variety of ways.²⁹⁵

Furthermore, a well-developed transport and communications infrastructure network is a prerequisite for less-developed communities to be able to access core economic activities and services. Effective modes of transport—including quality roads, railroads, ports, and air transport—enable entrepreneurs to get their goods and services to market in a secure and timely manner and facilitate the movement of workers to the most suitable jobs. Economies also depend on electricity supplies that are free of interruptions and shortages so that businesses and factories can work unimpeded. Finally, a solid and extensive telecommunications network allows for a rapid and free flow of information, which increases overall economic efficiency by helping to ensure that businesses can communicate and decisions are made by economic actors taking into account all available relevant information.

Deploying Digital Infrastructure

Digital infrastructure is about much more today than the landline telephone networks of the past. Today, it refers to the deployment of advanced wireless telecommunications networks and high-speed broadband networks and to enabling a range of ICT applications, from intelligent transportation systems (ITS) and mobile payments to health IT, digital signatures, and e-government.²⁹⁶ Thus, countries need to coordinate policies regarding competition and regulation, R&D, universal service, spectrum allocation, and national informatization plans.²⁹⁷ Developing countries should participate in discussion forums for continuous assessing and monitoring of the cutting-edge innovative regulatory tools and best practices that leader countries have explored in the hope of surmounting the challenges. In this regard, the latest institutional and regulatory trends indicated by Sundberg are worth noting for all regulators and policymakers. These include establishing a separate telecom/ICT regulator, setting clear dispute resolution mechanisms in a regulatory framework, and aggressively reforming the spectrum allocation process more toward market-based allocation.²⁹⁸

Recognizing that smart ICT policies can spur the digital transformation of their economies and societies, many countries have implemented specific ICT policies. For instance, the i-Japan 2015 strategy seeks to make Japan “a smart ubiquitous network society by 2015.” The strategy focuses on sectoral transformation through ICT, particularly in e-government, health care, and education. Korea’s “Ubiquitous Society” strategy envisions enabling citizens to use computers or mobile devices anytime, anywhere. The country has also implemented policies to support deployment of an Ultra-broadband Smart Network and a Ubiquitous Sensor Network (IP-USN).²⁹⁹

Likewise, Singapore has implemented a national ICT strategy. Intelligent Nation 2015 (iN2015) is Singapore’s 10-year ICT master plan, led by the Infocomm Development Authority of Singapore and designed to help the country maximize the potential of ICT. It has articulated national strategies for the deployment of critical digital infrastructure

platforms including ITS, contactless mobile payments for both smart cards and mobile phones, health IT, and digital signatures.³⁰⁰ It also includes a substantial investment in high-speed networks including the all-fiber Next Gen Nationwide Broadband Network (NGNBN) and a ubiquitous wireless network, Wireless@SG.³⁰¹ Other countries, such as the United Kingdom and United States, have also introduced national broadband plans.

Building an Educated and Skilled Workforce

Countries increasingly recognize talent as a vital source of competitive advantage and thus have made education and training a core component of their innovation strategies.³⁰² These countries recognize that talent has become “the world’s most sought-after commodity.” They know that, if a child receives an education, he or she is much more likely to get out of poverty and achieve a more prosperous future.

For example, Korea has made a national commitment to high-quality and universal education, including higher education, and has ensured that virtually all households have access at home to robust online learning tools. Finland has set a goal that all its young citizens will have the technical, analytic, and communications skills required for them to be competitive in a global economy the day they graduate from high school. Finland’s *Oivallus* (in English, “Insight”), a national educational foresight project, interviews corporations worldwide to understand what skills will be required by businesses in the years 2020 to 2030. It then advises how the Finnish education system needs to reform now so that students graduating in the future will be prepared to compete.³⁰³

Sweden introduced universal school vouchers that can be used at any accredited private, nonprofit, or public school in a sweeping reform to enhance the competitiveness of its secondary education system. Finland consolidated three of its institutes of higher learning—the Helsinki School of Economics, the University of Art and Design Helsinki, and the Helsinki University of Technology—into a single institution, Aalto University. Finland intends for it to become one of the world’s leading academic institutions at combining business, technology, and design by 2020. Likewise, Denmark—desiring to create four very strong, globally competitive universities—merged eight universities into four. Austria’s government invests in its workforce by enabling firms to receive a tax credit of 6 percent on the costs of education and training their workforce.³⁰⁴

In addition, immigration plays an important role in contributing to a country’s knowledge pool and creative potential by bringing in new perspectives and needed skills from afar.³⁰⁵ This “brain circulation” allows countries to dig deeply into the ever-expanding pools of knowledge and skills that exist beyond their borders, resulting in more innovation and prosperity both in-country and throughout the world at large.

Spurring Scientific and Engineering Research

A country’s science and R&D policies are crucial determinants of its economic vitality.³⁰⁶ For more developed nations with higher labor costs and greater skills, this often means increasing public funding for R&D; for less-developed nations, it often means implementing science and R&D policies that enable the nation’s organizations to adopt

newer and better technologies than are currently in use (although both these approaches are necessary for developed and developing nations alike). Underlying these policies is the fact that, without them, the level of innovation in an economy almost always is suboptimal from a societal perspective. Indeed, the significant spillover benefits from innovation mean that, even under “perfect” market conditions, the private sector will underinvest in the factors that produce innovation, including R&D. Furthermore, organizations often fail to adequately adopt existing innovations, in part because of “learning failures,” but also because spillover effects apply to companies’ investments in new capital equipment (for example, companies underinvest because they are unable to capture all of the benefits from their investments).³⁰⁷

Innovation and Productivity Policies

Finally, it’s important that countries implement explicit policies to spur technology adoption and development, to facilitate the movement and commercialization of technologies from universities or federal laboratories to the private sector, to help SMEs become more productive, and to spur the deployment of e-government solutions.

Innovation policies that leverage global knowledge networks and technology transfer compound the return to a country’s domestic innovation investments and raise innovation levels across the globe.

Developing a National Innovation and Productivity Strategy

Over just the past decade, scores of countries have come to the realization that spurring the innovation economy must be a central component of their economic development strategies. For example, in 2009, the United Kingdom made a conscientious decision to “place innovation at the center of our country’s economic growth strategy.”³⁰⁸ By now, some three dozen countries, including Ghana, India, Singapore, Thailand, and Uruguay, have created national innovation agencies and implemented national innovation strategies designed specifically to link science, technology, and innovation with economic growth.³⁰⁹

Innovation policy involves the same set of policy issues that countries deal with all the time, but focuses on how countries can address those issues with a view toward maximizing innovation and productivity. For example, countries can operate their government procurement practices the same way they always have, or they can reorganize their practices in a manner specifically designed to promote innovation. Likewise, countries can organize their corporate tax systems simply to raise revenues, or to raise revenues in ways that also

drive innovation and traded-sector competitiveness.³¹⁰ They can set up their science policies just to support science, or organize their investments in scientific research in ways that also support technology commercialization and the innovation needs of industry.

The most sophisticated countries recognize this. Their innovation strategies constitute a coherent approach that seeks to coordinate disparate policies on scientific research, technology commercialization, ICT investments, education and skills development, tax, trade, intellectual property, government procurement, and regulation in an integrated fashion that drives economic growth by fostering innovation. As Finland’s National Innovation Strategy argues, it is vital that a nation’s innovation strategies comprehensively address a broad set of policy issues because “piecemeal policy measures will not suffice in ensuring a nation’s pioneering position in innovation activity, and thus growth in national

productivity and competitive ability.”³¹¹ Ultimately, a country’s innovation policies constitute a game plan for how they can compete and win in the increasingly innovation-based global economy.

Spurring Technology Transfer and Commercialization

Innovation policies that leverage global knowledge networks and technology transfer compound the return to a country’s domestic innovation investments and raise innovation levels across the globe. In other words, obtaining the full benefits of university research relies on the effective transfer of knowledge from the university to the private sector so that it can be developed into marketable innovations. In the United States, the main provision of the Bayh-Dole Act of 1980 sought to promote the commercialization of university research by vesting the IP rights of government-funded research with the institution, instead of relying on the disparate policies of the funding agencies. U.S. institutions now earn royalties through the licensing of their research, providing an incentive for universities and other institutions to pursue opportunities for commercialization.³¹² Numerous countries, including Brazil, China, Indonesia, Japan, Malaysia, the Philippines, Russia, Singapore, South Africa, South Korea, and Taiwan have since followed the United States in establishing policies that grant to their universities IP ownership rights. India is currently considering implementing a Bayh-Dole-like policy as well.³¹³ Nevertheless, countries need to do much more to encourage innovative approaches to technology transfer from universities. For example, Litan, Mitchell, and Reedy suggest several alternative approaches that focus on increasing the number and speed of transferred innovations, as opposed to just the “patent-licensing big hits” encouraged by Bayh-Dole-like policies. These alternatives include open source collaborations between the university and industry, non-exclusive licensing of innovations, and the development of social networks for graduate students and university faculty.³¹⁴

Tax Incentives to Spur Investment in R&D and Innovation

A growing number of nations are introducing more generous tax credits for R&D, expanding the scope of activities covered by R&D tax credits, introducing collaborative R&D tax credits, and even introducing new tax instruments specifically designed to spur innovation. In fact, at least 40 nations now offer R&D tax credits.³¹⁵ While the United States was the first country to introduce an R&D tax credit in 1981, and as recently as 1992 offered the world’s most generous R&D credit, at least 26 nations now offer more generous R&D tax credits than does the United States. Today, Australia, France, and Spain have, by far, the most generous R&D tax incentive regimes.³¹⁶ But even Brazil, China, and India all now offer more generous R&D tax credits than does the United States.³¹⁷ Moreover, several countries, including Denmark, the Netherlands, and Norway, have begun to extend R&D tax credits to cover process R&D activities, effectively extending the R&D tax credit from goods to services industries as well.

Other nations have more generous credits for companies investing in national laboratories or universities. For example, in France, companies funding research at national laboratories and universities receive a 60 percent credit on every dollar invested. Belgium, Chile, Denmark, Hungary, Norway, Spain, and the United Kingdom provide firms more

generous tax incentives for collaborative R&D undertaken with public research institutions (than for R&D activity undertaken independently).³¹⁸ Japan's R&D incentive for research expenditures that companies make with universities and other research institutes is almost twice as generous as its regular credit.

Finally, several countries have recently adopted or expanded tax incentives designed to spur the commercialization of R&D. These incentives, or "patent boxes" (so-called because there is a box to tick on the tax form), allow corporate income from the sale of patented products to be taxed at a lower rate than other income.³¹⁹ For example, Belgium taxes income received from patents at a rate of 0 to 6.8 percent and Ireland at 0 percent. Switzerland has reduced corporate taxes on income from all intellectual property to between 1 and 12 percent. In 2010, the Netherlands expanded this incentive such that income derived from patents or R&D is taxed at just 10 percent, instead of the normal 25 percent rate.³²⁰ China, France, Ireland, Luxembourg, and Spain all also tax income from patents at reduced rates.

Fielding Robust E-Transformation Policies

Governments should view innovation as an explicit goal of their development process. When practical, governments should be early adopters of new technologies rather than solely relying on industry to lead the way. Through technological leadership in its purchases, governments can play an important role in spurring markets and deploying emerging technologies. For example, governments can lead by implementing e-government solutions and related applications, such as digital signatures and other electronic identification systems.³²¹

In addition, ICT usage in government is closely related to national e-government initiatives. Many leading countries recognize ICT as a useful tool that can enable public agencies to change from routine-based, command-and-control organizations that are inwardly focused on administration, to knowledge-based, networked, learning organizations that are externally focused on service. The Korean government's KONEPS (e-procurement), UNI-PASS (online customs service), Home Tax Service, and e-People are good examples of creative e-government services.³²² Though the Korean government invested \$1 billion from 2003 to 2007 in e-procurement systems, it estimates that, taking account of this ability to both repurpose government personnel and implement time-saving measures across the government, e-government saves far more than its costs. Korean officials estimate that e-government has produced \$16 billion worth of indirect economic benefits from more efficient government procurement, trade, and construction. Overall, Korea's government estimates that for every \$1 it has invested in e-government since 2003, it has saved \$17.³²³

Helping SMEs Become More Productive and Innovative

Small and medium-sized (SME) manufacturers play critical roles in supporting healthy manufacturing ecosystems and supply chains.³²⁴ Accordingly, many governments have introduced manufacturing extension services designed to boost the competitiveness, productivity, and efficiency of SME manufacturers.³²⁵ These countries' manufacturing

extension services play a number of roles, including: enhancing the efficiency of “shop floor” manufacturing processes and techniques; incentivizing SMEs to adopt higher-tech plant and equipment to improve productivity; promoting technological adoption by SME manufacturers; supporting technology transfer and commercialization; promoting knowledge transfer from universities or national laboratories to SMEs; directly performing or incentivizing SMEs to perform R&D; helping SME manufacturers link into global supply chains; and creating training programs for digital technologies, including those related to digital transactions (e-commerce), or to the use of information technology in manufacturing production processes.³²⁶ A number of developed and developing countries operate manufacturing extension programs or services, including Argentina, Australia, Brazil, Canada, Chile, Germany, Japan, Mexico, the United Kingdom, and the United States.

Several countries, including Austria, Canada, Belgium, Denmark, Germany, the Netherlands, Ireland, and Sweden (and even some U.S. states, such as Connecticut) have begun using innovation vouchers to support SME manufacturers. For example, the Netherlands’ innovation agency, Senter Novem, was the first to create an Innovation Voucher program, in the early 2000s. The Dutch program enables SMEs to “buy” expertise from public research institutions, universities, or large corporations, with the intent of stimulating knowledge transfer to the SMEs. Senter Novem has found that the program substantially stimulates innovation: eight out of ten vouchers issued resulted in an innovation that would not have otherwise come to fruition and 80 percent of new R&D jobs created in Holland since 2005 are attributable to the vouchers.³²⁷

Productive Innovation Policies Can Boost Growth

Effective innovation and productivity policies can make a difference for countries. Studying the gap between the innovation capacities of 23 countries in 1978 and then comparing them to their innovation capacities in 1999, Furman and Hayes found that the initially lagging countries that had subsequently developed innovation-enhancing policies—notably Denmark, Ireland, Finland, Singapore, South Korea, and Taiwan—dramatically increased their innovative output per capita and, by 1999, had overtaken countries such as the United Kingdom, France, and Italy.³²⁸ The authors found that these “once-follower” countries accelerated their growth rates both by adopting technologies from leader countries and by leapfrogging them through developing institutions that dealt with emerging challenges more effectively than nations bogged down in an older economic order. They conclude that innovation leadership among countries requires not only the development of innovation-enhancing policies and infrastructure, but also a commitment to maintaining substantial financial and human capital investments in innovation. The authors observe that these “once follower” countries now often lead the world in developing—and funding—integrated national innovation strategies.

Likewise, ITIF’s *Global Innovation Policy Index*, which provides a structured assessment of policies informing the innovation capacity of 55 countries, finds that countries’ GDP growth rates per capita are strongly correlated with robust innovation and productivity policies in areas including trade, tax, technology, intellectual property, and domestic

competition.³²⁹ Specifically, scores range from 0.552 in Finland, to 0.710 in Denmark, to 0.840 in Singapore. Thus, ITIF's *Global Innovation Policy Index* confirms the conclusions reached by Furman and Hayes, finding a strong link between effective innovation policies and more robust economic growth.

Implementing these types of productivity- and innovation-enhancing policies is the superior path for countries to realize more robust and sustainable economic growth, and to enable their economy and enterprises within to compete in global markets based on their merits, instead of by resorting to trade-distorting measures such as localization barriers to trade.

AN AGENDA TO ROLL BACK LOCALIZATION BARRIERS TO TRADE

LBTs can and often do harm the countries that use them, and they do harm to the countries affected by their use as well as to the overall global economy. Yet, nations do not need LBTs for development; there are better alternative economic development policies available to them. Despite this, use of LBTs grows unchecked. The first step in rolling them back will be to ensure that the WTO process better allows effective challenges to LBTs, and to comprehensively update WTO rules to prohibit countries' use of localization barriers to trade. Second, global multilateral organizations and individual nations committed to free trade principles—including the United States, Japan, and the European Union nations—should take assertive actions. This section presents several policy recommendations to address the growing spread of LBTs.

Develop Mechanisms to Track LBTs

A first step in rolling back LBTs is to develop a better mechanism to track them. The World Bank, International Monetary Fund, WTO, and their respective trade statistics databases do not track the implementation of LBTs, making it difficult to quantify their exact impact on national economies as well as on the global marketplace. Thus, the WTO should create and manage a database, similar to the Integrated Trade Intelligence Portal (I-TIP), that would track and record countries' LBT measures in order to document the extent of their use and contribute to further analysis of just how much damage they are doing to global growth and development.

Update WTO Rules

The failure to conclude the Doha Development Agenda (DDA) has had the effect of limiting the WTO's agenda mostly to the arena of conventional trade barriers (although the recent effort in services liberalization holds promise). But changes in the global economy, along with changes in the concept of a traditional trade barrier, are forcing a reconsideration of what should be part of future trade negotiations. The evidence for this lies in the various bilateral and regional arrangements that have proliferated recently. So, the question is not whether LBTs will be addressed as a part of trade negotiations. The only question is whether they will be addressed in the WTO, or solely in some bilateral and regional arrangements beyond the WTO's ambit.

However, the WTO does have some rules governing LBTs. For example, paragraph 1(a) in the Illustrative List of the Agreement on Trade Related Investment Measures (TRIMS Agreement) prohibits local content requirements. Specifically, it states that trade policies that are inconsistent with the definition of national treatment in the 1994 GATT—prohibiting discrimination between imported and domestically produced goods—include those which require:

The purchase or use by an enterprise of products of domestic origin or from any domestic source, whether specified in terms of particular products, in terms of volume or value of products, or in terms of a proportion of volume or value of its local production.³³⁰

Unfortunately, this policy has not prevented the continued adoption of LCRs and other kinds of LBTs by certain nations. This suggests the need not just for stronger enforcement of this rule, but an expanded definition of LBTs.

The question is not whether LBTs will be addressed as a part of trade negotiations. The only question is whether they will be addressed in the WTO, or solely in some bilateral and regional arrangements beyond the WTO's ambit.

Bring More WTO Cases

Several countries (notably the European Union and the United States) have brought LCR cases to the WTO, but given that LCRs are still widespread, many more LCR cases are needed.

One recent case was filed by the United States against India in February 2013 for its local content restrictions in the production of solar equipment. As noted, India discriminates against foreign solar equipment manufacturers by requiring solar energy producers to use Indian-manufactured solar cells and modules and by offering subsidies to those developers for using domestic equipment instead of imports. As former U.S. Trade Representative Ron Kirk noted in bringing the case, “India’s discriminatory policies in its national solar program detract from that successful cooperation, raise the cost of clean energy, and undermine progress toward our shared objective.”³³¹ The dispute remains under consultations at the WTO.³³²

In June 2011, the European Union and Japan launched a similar case against Canada for its feed-in subsidies for renewable energy producers that use Canadian technology. In December 2012, WTO judges agreed with the EU and Japan that provisions of the program discriminated against foreign suppliers by affording less-favorable treatment to imported equipment and components than to like-products originating in Ontario.³³³ Energy Minister Bob Chiarelli said Ontario intends to comply with the WTO ruling, which means the province will change its domestic content requirements for the feed-in-tariff program for wind and solar projects, hopefully by early 2014.³³⁴

Unfortunately, cases like these are not as common as they should be. The message needs to be made clear: the international trade community will not tolerate localization barriers to trade. The European Union, the United States, and other like-minded economies (such as Japan) need to bring more LBT cases to the WTO. Doing so combats LBTs, especially in situations where the WTO rules against obviously illegal LCR provisions. More

importantly, more cases would make it clear to nations considering LBTs that prosecution for such trade-distorting practices is likely to occur.

Expand Definition of LBTs

WTO laws on LCRs leave out other forms of localization barriers to trade, including forced technology transfer, forced offsets, forced intellectual property licensing, and forced localization of data centers. This suggests the need for the WTO to expand its sphere to include negotiation of rules with specific standards with regard to LBTs.

This is important for two reasons. First, it provides a dispute settlement mechanism to allow more LBT cases to be brought to the WTO. Second, it provides a baseline other nations can use when establishing their own bilateral and regional trade agreements. Without clear WTO rules to draw from, countries are left to draw their own lines regarding the definition and scope of LBTs.

The WTO needs to extend its reach by not only creating rules to deal with these new issues, but also by making its dispute settlement mechanism applicable to such rules. The WTO can make a significant contribution to this cause by extending the reach of its dispute settlement mechanism to the application and interpretation of LBTs beyond LCRs. The stalled DDA is the perfect opportunity to achieve this; there is still time to add it to the agenda, and waiting until the next round could mean decades. Another option is to use a format similar to the successful Information Technology Agreement—i.e., allowing countries to opt-in to a treaty that firmly condemns LBTs.

Complete Trade Agreements that Eliminate LBTs

While the WTO needs to craft rules that allow for more robust prosecution of LBTs, countries shouldn't wait around until this happens. The United States and other like-minded economies need to act on their own. A key way to do this is to craft high-standard free trade agreements, starting with the Trans-Pacific Partnership (TPP) and the Trans-Atlantic Trade and Investment Partnership (T-TIP) Agreement.

These agreements need to include strong and enforceable provisions against LBTs. But besides helping to roll back LBTs among nations signing these agreements, a key goal of these agreements should be the creation of an alliance that will force those countries adopting these harmful practices to the sidelines of the global trade arena. Countries that adhere to internationally accepted free trade standards will benefit from the growth and development opportunities inherent in the accession to high-standard regional and bilateral trade agreements. Especially with the DDA stalled, the immediate future of global trade lies in the growing proliferation of such trade agreements. The WTO has been notified of 38 in-negotiation regional trade agreements, with 259 already in force.³³⁵ Thus, it is imperative that more countries negotiate agreements that effectively address non-tariff barriers, including LBTs.

Remove Preferences for Countries that Systematically Use LBTs

A number of countries have developed preferential trade treatment programs designed to benefit least-developed countries (LDCs) and developing countries. The most common is the Generalized System of Preferences (GSP), which allows developed members of the WTO to give more favorable treatment to developing countries. Legally allowed under the Enabling Clause of the GATT in 1979, GSP specifically permits developed countries to provide a system of exemption from the most favored nation principle (MFN) that obliges WTO member countries to treat the imports of all other WTO member countries no worse than they treat the imports of their “most favored” trading partner. In essence, MFN requires WTO member countries to treat imports coming from all other WTO member countries equally; that is, by imposing equal tariffs on them. GSP exempts WTO member countries from MFN for the purpose of lowering tariffs for the least developed countries, without also lowering tariffs for rich countries. GSP-benefit-giving countries unilaterally determine which countries and which products are included in their programs.

For example, the United States’ Generalized System of Preferences program, instituted on January 1, 1976 by the Trade Act of 1974 (during the height of the Cold War, when America was trying to keep the developed world from tilting toward the Communist axis), is designed to promote economic growth in the developing world by providing preferential duty-free entry for up to 5,000 products when imported from one of 127 designated beneficiary countries and territories. Countries receiving GSP benefits exported \$19.9 billion worth of goods and services to the United States under the program in 2012.³³⁶ GSP benefits, however, are not arbitrarily assigned. Countries receiving GSP benefits exported \$19.9 billion worth of goods and services to the United States under the program in 2012.³³⁷ GSP benefits, however, are not arbitrarily assigned. Countries are supposed to fulfill certain criteria in order to receive these U.S. trade preferences, namely: protecting intellectual property rights, affording internationally recognized workers’ rights, refusing to harbor individuals who have committed acts of international terrorism, refusing to withhold supplies, and refraining from raising prices of vital commodities in international trade.³³⁸

But these provisions are largely symbolic, especially as they pertain to IP protection. Of the 127 countries listed as GSP beneficiaries by the U.S. Trade Representative, 18 are on the 2013 *Special 301 Report*, an annual review of countries that provide unsatisfactory intellectual property rights protection policies.³³⁹ Ukraine was listed as a Priority Foreign Country (PFC), a country that is one of the most egregious violators of intellectual property rights. Seven countries receiving GSP benefits—Algeria, India, Indonesia, Pakistan, Russia, Thailand, and Venezuela—are listed on the Report’s Priority Watch List, which indicates countries in which very severe violations of intellectual property rights occur. Ten additional GSP beneficiaries are identified on the Watch List, which indicates countries in which slightly less severe violations of intellectual property rights occur. These include Bolivia, Brazil, Ecuador, Egypt, Jamaica, Lebanon, Paraguay, the Philippines, Turkey, and Uzbekistan.

Several of these IP violations include instances of forced licensing of intellectual property or specific preference for local products. For example, Algeria was cited for failing “to address

the ban on an increasing number of imported pharmaceutical products and medical devices in favor of local products.”³⁴⁰ Regarding India, the 2013 *Special 301 Report* “urges India to resist imposing discriminatory policies or other counterproductive measures in pursuit of that objective at the expense of adequate and effective protection of IPR. Recent measures that raise such concerns include India’s Preferential Market Access (PMA) policy for electronic products and a proposed drug pricing policy, both of which appear to condition certain preferential treatment on the indigenous development of IPR.”³⁴¹ Just as the United States should remove GSP preferences for countries that appear on USTR’s *Special 301 Report*, (which it largely does not do), so should it remove GSP preferences for countries that field localization barriers to trade.

And in fact, the United States did this between 2001 and 2005 for Ukraine. Ukraine was listed a Priority Foreign Country for failure to combat piracy during this time period. Correspondingly, during the mandatory country review process that occurs as a result of a PFC listing, Ukraine lost its GSP benefits. GSP benefits were reinstated in 2006, when Ukraine was moved off the PFC list. Unfortunately, it appears the loss of GSP benefits was not strongly felt, because Ukraine again found itself designated as a PFC in 2013. It remains to be seen what further sanctions will occur as a result of this designation, as the mandatory country review process has only just begun.

Just as the United States should remove GSP preferences for countries that appear on USTR’s Special 301 Report, so should it remove GSP preferences for countries that field localization barriers to trade.

However, the United States is not the only country with a GSP program. Australia, Canada, Belarus, the European Union countries, Iceland, Japan, Kazakhstan, New Zealand, Norway, and Russia all also employ similar programs. Ranging in number of beneficiaries between 48 (Iceland) and 176 (the European Union and Turkey), each of these programs has different requirements for eligibility and different goods that are covered under the benefits program. Specifically, with regard to LBTs in the European Union, GSP preferences can be revoked for:

Serious and systematic unfair trading practices including those affecting the supply of raw materials, which have an adverse effect on the Union industry and which have not been addressed by the beneficiary country. For those unfair trading practices, which are prohibited or actionable under the WTO Agreements, the application of this Article shall be based on a previous determination to that effect by the competent WTO body.³⁴²

Despite this language, the European Union has generally only suspended a recipient country’s GSP benefits for failure to adhere to international codes of labor and human rights. Even when the EU has brought cases to the WTO for “unfair trading practices,” it has not revoked GSP preferences. For example, despite bringing a case against Argentina in 2012 for import restrictions, Argentina still enjoys EU GSP privileges, even though it was engaging in a practice actionable by the WTO.³⁴³

This suggests that neither the United States nor the European Union are fully committed to taking steps to combat LBTs. Yet nations that seek to gain trade benefits, such as GSP preferences, need to play by the rules. The United States and the European Union should

remove those countries that egregiously violate intellectual property rights and commit unfair trading practices from their GSP programs to send a strong message regarding the effects of LBTs, not only on their own economies, but on the global one as well.

Empower Firms to Fight Back

Another way to limit LBTs is to empower firms to more effectively fight back. As it stands, nations often have more bargaining power than the foreign firms seeking domestic market access. One way for firms to fight back is for them to help bring more WTO cases. But there are several reasons why it's sometimes difficult for companies to do so. Though the U.S. government brings the cases, firms must initiate the process by bringing them to U.S. attention. This can not only be expensive but the "free rider" problem means that companies can get all the benefits even if they don't participate, as long as other firms in their industry bear the burden of helping USTR to bring a WTO case. In order to remedy this, the U.S. Congress should encourage companies to build WTO cases by allowing them to take a generous tax credit (on the order of 40 percent) for expenditures related to bringing cases.³⁴⁴

Developed countries need to work alongside international development organizations and other global institutions to reformulate foreign aid policies to use them as a carrot and stick to push countries to eschew LBTs.

Firms not only need to help bring more cases, they need to do more to resist government LBT actions. However, foreign companies often succumb to a country's LBT policies because they don't really have a choice; they either give up their technology or their access to some of the world's fastest growing markets, and in the process lose out to competitors who are willing to make the essentially Hobson's choice. Industrial organization economists refer to a market like this as monopsonistic, where one buyer can largely set whatever terms it wants to competitive sellers. However, if firms in the same industry could coordinate actions regarding technology transfer and investment in particular nations, they could more effectively exert pressure against these policies, since they would be speaking and acting with one voice. Therefore, Congress should pass legislation that allows firms to ask the Department of Justice for an exemption to coordinate actions regarding technology transfer and investment to other nations.³⁴⁵ For example, if companies in a similar industry can agree that none of them will transfer technology to a nation like China in order to gain market access, then the Chinese government will have much less leverage over them. This would effectively enable firms—and indeed entire industries—to undertake "capital strikes" (i.e., wholesale refrain from investing capital) in countries that continue to insist upon fielding LBTs. The European Union should also pass a similar measure, and EU and

U.S. anti-trust authorities should allow this kind of joint cooperation among EU and U.S. firms. The authority would be strictly limited to cooperation on investment and technology transfer in response to unfair foreign trade practices.

Reform Global Institutions

One reason why LBTs continue to proliferate is that the nations putting them in place believe they are effective and they know that even if they are called out on the practice, there will be little pushback from third parties. To remedy this, developed countries need to work alongside international development organizations and other global institutions to reformulate foreign aid policies to use them as a carrot and stick to push countries to

eschew LBTs and to rather implement the right kinds of development policies. Two principles need to guide developed countries' foreign aid policies. First, foreign economic development assistance should focus more on enhancing the productivity of developing countries' domestic, non-traded sectors; not on helping their export sectors, especially their advanced technology sectors, become more competitive.

Second, blatantly mercantilist countries that impose significant localization trade barriers, engage in IP theft, or use other protectionist measures should have their foreign aid privileges withdrawn or cutback until they show significant progress in reducing their use of these kinds of policies. The message to these countries should be that if they want to engage the global community for development assistance, mercantilist policies cannot constitute the “dominant logic” of their innovation and economic growth strategies. If countries are implementing forced localization policies in a systematic way, the global community should support them less; if they are implementing across-the-board productivity-based growth and open trade policies, we should support them more.

In particular, developed countries and international and national development organizations—such as the World Bank, the International Monetary Fund, the World Trade Organization, the OECD, the United States' Agency for International Development, the Overseas Private Investment Corporation, the Export-Import Bank, and EuropeAid—all need to cut off foreign aid to countries fielding egregious LBTs. But it was not until the end of 2009 that Germany stopped giving foreign aid assistance to China.³⁴⁶ The United States gave China \$120 million in foreign aid assistance from 2005 to 2008.³⁴⁷ In 2009, the World Bank posted \$10 billion in outstanding loans to China, spread across 75 projects. In fact, from 2009 to 2010, China actually lent more money than the World Bank to developing countries, with China signing at least \$110 billion of loans to other developing country governments and companies in 2009 and 2010, while the World Bank made loan commitments of \$100.3 billion to such countries from mid-2008 to mid-2010.³⁴⁸ It makes little sense for the international community to continue to support countries fielding extensive trade-distorting practices such as LBTs.

Put simply, countries and global organizations alike need to stop promoting export-led growth as a key development tool, and instead tie their assistance to steps taken by

developing nations to move away from mercantilist policies including LBTs. In particular, the World Bank should make a firm commitment that it will cut off support for countries that continue to use localization barriers to trade.

CONCLUSION

As innovation and trade policy have become increasingly intertwined, openness to trade—characterized by open market access and receptivity to foreign direct investment—has become a bedrock pillar of a country's innovation capacity. But all too often, countries are electing to pursue mercantilist, trade-distorting, beggar-thy-neighbor approaches—such as localization barriers to trade—instead of implementing productivity and innovation-enhancing policies designed to promote economic growth. While such mercantilist

practices sometimes fail, in many cases they do succeed—at least in the short run—in having the desired effect of moving countries to higher-value-added production activities, often at the expense of foreign nations, and especially if other nations do little to contest the practice. Unfortunately, this strategy ignores the harmful effects of LBTs: they hurt the economies not using them, they hurt the global economy, and they hurt the countries fielding them. Instead, countries need to focus on broad enterprise support, including policies that get key framework conditions correct, create effective regulatory, tax and trade regimes, support the use of key inputs, and establish national innovation and productivity frameworks. In order to move the world toward a new approach to globalization, the international community must recognize that the only sustainable path to raising living standards in developed and developing countries is to leverage innovation to raise economies' productivity across-the-board in all firms and all sectors. By using “good” innovation policies—not resorting to trade-distorting innovation mercantilist practices—countries will realize the innovation-based growth they seek in the 21st century.

APPENDIX A: SUMMARIZES COUNTRIES' LOCALIZATION BARRIERS TO TRADE, BY TYPE:

| Country | Local Production a Requirement for Market Access | Local Content Requirements | Forced Offsets | Forced Technology or IP Transfer as Condition of Market Access | Compulsory Licenses |
|--------------|--|----------------------------|----------------|--|---------------------|
| Argentina | √ | √ | √ | | |
| Australia | √ | √ | | | |
| Austria | | | √ | | |
| Brazil | √ | √ | | | √ |
| Brunei | √ | | | | |
| Canada | √ | √ | | | |
| China | √ | √ | | √ | |
| Denmark | √ | | | | |
| Ecuador | | | | | √ |
| Egypt | | | | | √ |
| France | √ | √ | | | |
| Greece | √ | | √ | √ | |
| India | √ | √ | √ | √ | √ |
| Indonesia | √ | √ | | √ | √ |
| Israel | | | √ | | |
| Japan | | | | √ | |
| Kazakhstan | √ | | | | |
| Lithuania | | | √ | | |
| Malaysia | √ | √ | | √ | √ |
| Mexico | | √ | | √ | |
| Morocco | | | | √ | |
| New Zealand | √ | | | | |
| Nigeria | √ | √ | | √ | |
| Norway | √ | | | | |
| Oman | | | √ | | |
| Portugal | | | | √ | |
| Romania | | | √ | | |
| Russia | √ | √ | | | |
| Saudi Arabia | | | √ | | |
| South Korea | √ | √ | | | |
| Spain | | √ | | | |
| Taiwan | √ | | | | √ |
| Thailand | | | | | √ |

| | | | | |
|-----------|---|---|---|---|
| Turkey | √ | √ | √ | √ |
| Uganda | | √ | | |
| Ukraine | | √ | | |
| UAE | | | √ | |
| UK | | | √ | |
| U.S. | | √ | | |
| Vietnam | √ | √ | | |
| Venezuela | √ | | | √ |

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ABOUT THE AUTHORS

Dr. Robert Atkinson is the president of the Information Technology and Innovation Foundation. He is also the author of the books *Innovation Economics: The Race for Global Advantage* (Yale University Press, September 2012) and *The Past and Future of America's Economy: Long Waves of Innovation that Power Cycles of Growth* (Edward Elgar, 2005). Dr. Atkinson received his Ph.D. in City and Regional Planning from the University of North Carolina at Chapel Hill in 1989.

Stephen Ezell is a senior analyst at the Information Technology and Innovation Foundation, with a focus on science, technology, and innovation policy issues. 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 *Innovation Economics: The Race for Global Advantage* (Yale University Press, September 2012).

Michelle Wein is a research analyst at the Information Technology and Innovation Foundation, focusing on the connections between international trade, innovation, intellectual property, and economic productivity. Ms. Wein holds a Masters in Public Policy from Georgetown University and a B.S. with Honors in Economics and Mathematics from the University of Michigan.

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